HANDBOUND
AT THE

UNIVERSITY OF

3902

PUBLICATIONS

OF THE

AMERICAN

ECONOMIC ASSOCIATION

THIRD SERIES, VOLUME V

1904

68169
6/17/06

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON : SWAN SONNENSCHEIN & CO.
1904

HB
1
A5
ser. 3
v. 5

CONTENTS OF VOLUME FIVE, THIRD SERIES.

PAGES

NUMBER 1.—PAPERS AND PROCEEDINGS OF THE SIXTEENTH ANNUAL MEETING. PART I. ..... 1—244

Introduction 1
Constitution 3
By-Laws 5
Officers 7
Council 8
List of Members 12
Council Meeting 41
Presidential Address, Edwin R. A. Seligman 49
Sugar. William C. Stubbs 79
Rice. S. A. Knapp 102
Cotton and General Agricultural Outlook. D. F. Houston 113
Tobacco. Lawson H. Shelfer 129
The Cotton Industry. D. A. Tompkins 144
The Utilization of Southern Wastes. Richard H. Edmonds 162
The Relations between Rent and Interest. Frank A. Fetter 176
Index 241

NUMBER 2.—PAPERS AND PROCEEDINGS OF THE SIXTEENTH ANNUAL MEETING. PART II 245–448

The Management of the Surplus Reserve. Edward S. Meade 245
The Theory of Loan Credit in Relation to Corporation Economics. J. Pease Norton 280
State Taxation of Interstate Commerce. Frank J. Goodnow 307
Trusts. Henry C. Adams 335
A Theory of Social Causation. Franklin H. Giddings 383
Index 445

NUMBER 3.—MONOPOLISTIC COMBINATIONS IN THE GERMAN COAL INDUSTRY. Francis Walker 449–790

Contents v
Introduction 457
Part I : General Aspects of the Coal Industry 461
Part II : History of Coal Combinations 494
Part III : Internal Organization and Policy of the Coal and Coke Cartells 534

Part IV : Analysis of the Operation of the Coal and Coke Cartells ---- 577
Part V : Regulation and Reform ---- 760
Bibliographical References ---- 784

NUMBER 4.—THE INFLUENCE OF FARM MACHINERY ON PRODUCTION AND LABOR. H. W. Quaintance ---- 791–904
Contents ---- v
Part I : Historical Survey ---- 799
Part II : Machinery and Production ---- 810
Part III : Machinery and Labor ---- 827
Appended Tables ---- 891

CONTENTS—PART I

PAGE

THE AMERICAN ECONOMIC ASSOCIATION:

Introduction 1
Constitution 3
By-laws 5
Officers for the Year 1904 7
Council 8
List of Members 12
Summary of Membership 37

THE SIXTEENTH ANNUAL MEETING OF THE ASSOCIATION:

Program 38
Council Meetings 41
Report of the Secretary 41
Report of the Treasurer 44
Resolutions 47

PAPERS AND DISCUSSIONS:

Social Aspects of Economic Law. Presidential address by Edwin R. A. Seligman 49
Address of Welcome. By Edwin A. Alderman 74
Sugar. By William C. Stubbs 79
Discussion: John Dymond 99
Rice. By S. A. Knapp 102
Discussion: S. Locke Breaux 110
Cotton and the General Agricultural Outlook. By D. F. Houston 113
Discussion: Geo. K. Holmes, W. C. Stubbs 122
Tobacco. By Lawson H. Shelfer 129
Discussion: J. B. Killebrew, W. H. Glasson 135
The Cotton Industry. By D. A. Tompkins 144
Discussion: C. C. Thach 154
The Utilization of Southern Wastes. By Richard H. Edmonds 162

The Relations between Rent and Interest. By Frank A. Fetter 176
Discussion : Thomas N. Carver 199
Jacob H. Hollander 204
Charles W. MacFarlane 209
Lindley M. Keasbey 216
W. G. Langworthy Taylor 218
Richard T. Ely 221
James E. Le Rossignol 224
Franklin H. Giddings 225
Winthrop M. Daniels 226
Frank A. Fetter 227

INDEX 241

PUBLICATIONS

OF THE

AMERICAN ECONOMIC ASSOCIATION

THIRD SERIES. ISSUED QUARTERLY.
VOL. V, NO. 1. PRICE, $4.00 PER YEAR.

PAPERS AND PROCEEDINGS

OF THE

SIXTEENTH ANNUAL MEETING

PART I

NEW ORLEANS, LA.

DECEMBER 29–31, 1903

FEBRUARY, 1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON: SWAN SONNENSCHEIN & CO.

Copyright, 1904, by
AMERICAN ECONOMIC ASSOCIATION

PRESS OF
ANDRUS & CHURCH
ITHACA, N. Y.

EDITORIAL NOTE.

As the program at the meeting in New Orleans was unusually full, the Publication Committee directed that the Proceedings be published this year in two parts. The delay in the issue of the first part has been caused by the failure to secure the promised stenographic report of the discussions. The kind coöperation of the speakers has, at the cost of time and effort to all concerned, made good a large part of the loss. Some of the discussions, however, it has been impossible to recall after the lapse of so long a time; and other discussions could be reproduced only in a much abridged form. These lacks are much to be regretted, yet taken together the two parts of this year's "Papers and Proceedings" will, it is believed, equal the former reports in quality, and considerably exceed them in quantity.

The group of papers and discussions on Southern questions, and the group on rent and interest, have been issued as separate reprints at the price of fifty cents each.

It is expected that Part II will be issued before the end of the month of May, in which it is dated. It will contain the papers and discussions of the sessions on State and Corporate Finance, The Trust Problem, and Sociology and History.

FRANK A. FETTER,
Secretary.

March 28, 1904.

AMERICAN ECONOMIC ASSOCIATION

The American Economic Association is an organization composed mainly of persons interested in the study of political economy or the economic phases of political and social questions. As may be seen by examining the list of members and subscribers printed in this volume, not only are all universities and most prominent colleges in the country represented in the Association by their teachers of political economy and related subjects, but even a larger number of members come from those interested as business men, journalists, lawyers or politicians in the theories of political economy or, more often, in their applications to social life. There are further more than one hundred subscribers, nearly all being large libraries.

The first two meetings of the Economic Association in 1885 and 1887, and the meetings of 1897, 1898, 1900, 1901, 1902 and 1903, were at the same place as those of the American Historical Association. Joint sessions and less formal gatherings of the members of the two Associations were thus held. The annual meetings give opportunity for social intercourse among the teachers and public men composing the Association's membership. They contribute also to create and cement acquaintanceship and friendship between teachers of economics and cognate subjects in different institutions, and so to counteract any tendency to particularism which the geographical separation and the diverse traditions of American colleges might be deemed to foster.

The Publications of the Association, a complete list

of which is printed at the end of this volume, were begun in March, 1886. The first series of eleven volumes was completed by a general index in 1897. The second series, comprising two volumes, was published in 1897–99, and in addition thereto the Association issued, during 1896–99, four volumes of Economic Studies. In 1900, a third series of quarterly Publications was begun with the Papers and Proceedings of the Twelfth Annual Meeting, and has been continued since with ample amount and variety of matter. It is intended to add to these quarterly numbers, from time to time, such monographic supplements as the condition of the treasury and the supply of suitable manuscript may make possible.

The American Economic Association is the organ of no party, sect or institution. It has no creed. Persons of all shades of economic opinion are found among its members, and widely different views are given a hearing in its annual meetings and through its publications.

The officers of the Association and the contributors to its Publications receive no pay for their services. Its entire receipts are expended in printing and circulating the Publications and in the slight expenses attendant upon the annual meetings. Any member, therefore, may regard his annual dues either as a subscription to an economic publication, a payment for membership in a scientific association, or a contribution to a publication fund for aiding the publication of valuable manuscript that might not be accepted by a publishing house governed primarily by motives of profit, and that could not be published by the writer without incurring too heavy a burden of expense.

CONSTITUTION

ARTICLE I.

Name.

This Society shall be known as the American Economic Association.

ARTICLE II.

Objects.

1. The encouragement of economic research, especially the historical and statistical study of the actual conditions of industrial life.

2. The publication of economic monographs.

3. The encouragement of perfect freedom of economic discussion. The Association as such, will take no partisan attitude, nor will it commit its members to any position on practical economic questions.

4. The establishment of a bureau of information designed to aid members in their economic studies.

ARTICLE III.

Membership.

Any person may become a member of this Association by paying three dollars, and after the first year may continue a member by paying an annual fee of three dollars. On payment of fifty dollars any person may become a life member, exempt from annual dues.[1]

ARTICLE IV.

Honorary Members.

The Council may elect foreign economists of distinction not exceeding twenty-five in number, honorary members of the Association. Each honorary member shall be entitled to receive all reports and publications of the Association.

[1]Note—Each member receives all reports and publications of the Association.

ARTICLE V.

Officers.

The officers of the society shall consist of a President, three Vice-Presidents, a Secretary, a Treasurer, a Publication Committee, and a Council.

ARTICLE VI.

Council.

1. The Council shall consist of an indefinite number of members of the society, chosen, with the exception of the original members, for three years. It shall have power to fill all vacancies in its membership, and may add to its number.

2. It shall elect the President, Vice-Presidents, Secretary, and Treasurer; the President, the Secretary, the Treasurer, the Chairman of the Publication Committee, and the ex-Presidents, together with three other members to be elected by the Council, shall constitute an Executive Committee with such powers as the Council may entrust to it; provided, that a quorum shall consist of four of the seven elected officers; and provided further that the offices of Secretary and of Treasurer may be filled by one person, and that the offices of Vice-President and of elected member of the Executive Committee may be filled by one person.

3. The Council shall organize itself into a number of standing committees upon the various lines of research undertaken. These committees shall prepare reports from time to time upon such subjects relating to their respective departments as they may select, or as may be referred to them by the Council. These reports shall be presented to the Council at its regular or special meetings and be open to discussion. All papers offered to

the society shall be referred to the appropriate committees before being read in Council.

4. The Council shall have charge of the general interests of the society, and shall have power to call meetings and determine what reports, papers, or discussions are to be printed, and may adopt any rules or regulations for the conduct of its business not inconsistent with this constitution.

5. The Council shall elect a Committee on Publications, which shall consist of six members, so classed that after the first election the term of two members shall expire each year. This committee shall have charge of and responsibility for the scientific publications of the Association.

ARTICLE VII.

Amendments.

Amendments, after having been approved by a majority of the Council, may be adopted by a majority vote of the members present at any regular meeting of the Association.

BY-LAWS.

1. The President of the Association, who shall be *ex-officio* a member of the council, shall preside at all meetings of the Council and Association, and perform such other duties as may be assigned to him by the Council. In case of inability to perform his duties, they shall devolve upon the Vice-Presidents in the order of their election, upon the Secretary and Treasurer, and upon the Chairmen of the Standing Committees, in the order in which the committees are mentioned in the list.

2. The Secretary shall keep the records of the Association, and perform such other duties as the Council may assign to him.

3. The Treasurer shall receive and have the custody of the funds of the Association, subject to the rules of the Council.

4. The following Standing Committees shall be organized:

(1) On Labor.
(2) On Transportation.
(3) On Trade.
(4) On Public Finance.
(5) On Industrial and Technical Education.
(6) On Exchange.
(7) On General Questions of Economic Theory.
(8) On Statistics.
(9) On Teaching Political Economy.

The Executive Committee may appoint such special committees as it may deem best.

5. At any meeting called by the general summons of the President five members shall constitute a quorum.

6. Papers offered for the consideration of the Council, shall be referred by the Secretary, each to its appropriate committee.

7. In order to encourage economic research, the Association proposes to render pecuniary assistance in the prosecution of the same, and to offer prizes for the best monographs upon selected topics. It stands ready to accept and administer any fund placed at its disposal for either purpose.

8. The Executive Committee shall have power at any time to add new members to the Council.

9. The Executive Committee shall assign all members of the Council to one of the Standing Committees, and shall appoint the Chairmen of the Committees.

10. It shall be the duty of the Chairmen of the respective Committees to organize and direct the work of the same, under the general control of the Council.

EX-PRESIDENTS

*Francis A. Walker,
Massachusetts Inst. of Technology.

*Charles F. Dunbar,
Harvard University.

John B. Clark,
Columbia University.

Henry C. Adams,
University of Michigan.

Arthur T. Hadley,
Yale University.

Richard T. Ely,
University of Wisconsin.

Edwin R. A. Seligman,
Columbia University.

OFFICERS FOR THE YEAR 1904

President.

Frank W. Taussig,
Harvard University.

Vice-Presidents.

Irving Fisher,
Yale University.

John W. Gray,
Northwestern University.

John Graham Brooks,
Cambridge, Mass.

Secretary and Treasurer.

Frank A. Fetter,
Cornell University, Ithaca, N. Y.

Publication Committee.

Jacob H. Hollander, Chairman,
Johns Hopkins University, Baltimore, Md.

Thomas N. Carver,
Harvard University.

Davis R. Dewey,
Massachusetts Inst. of Technology.

David Kinley,
University of Illinois.

William A. Scott,
University of Wisconsin.

Henry R. Seager,
Columbia University.

Executive Committee.

Ex-Officio Members—

The President

The Secretary-Treasurer

The Chairman Publ. Com.

Elected Members—

Winthrop M. Daniels,
Princeton University.

Henry B. Gardner,
Brown University.

William Z. Ripley,
Harvard University.

*Deceased.

COUNCIL

Term of office expiring in 1905.

Foy Spencer Baldwin, Boston University.
Don C. Barrett, Haverford College.
Charles Beardsley, Harvard University.
William F. Blackman, Rollins College.
John Graham Brooks, Cambridge, Mass.
William M. Burke, Albion College.
Robert C. Chapin, Beloit College.
Walter E. Clark, New York City.
Frederic R. Clow, Oshkosh Normal College.
James W. Crook, Amherst College.
John F. Crowell, Bureau of Statistics, Treasury Department.
Edward T. Devine, Charity Organization Society, N. Y.
Richard T. Ely, University of Wisconsin.
Roland P. Falkner, Library of Congress.
Henry W. Farnam, Yale University.
Henry Ferguson, Trinity College.
Irving Fisher, Yale University.
George M. Fisk, University of Illinois.
Worthington C. Ford, Library of Congress.
Hamline H. Freer, Cornell College.
Henry B. Gardner, Brown University.
George P. Garrison, University of Texas.
Franklin H. Giddings, Columbia University.
Nicholas P. Gilman, Meadville, Pa.
William H. Glasson, Trinity College.
Frank J. Goodnow, Columbia University.
Elgin R. L. Gould, New York City.
Frederick C. Hicks, University of Cincinnati.
Jacob H. Hollander, Johns Hopkins University.
Edmund J. James, Northwestern University.
Emory R. Johnson, University of Pennsylvania.
Edward D. Jones, University of Michigan.
Lindley M. Keasbey, Bryn Mawr College.
Gustav A. Kleene, Swarthmore College.
Isidor Loeb, University of Missouri.
Frank L. McVey, University of Minnesota.
Jesse Macy, Iowa College.
Milo R. Maltbie, Art Commission of New York City.
Balthasar H. Meyer, University of Wisconsin.
Herbert E. Mills, Vassar College.

THOMAS W. PAGE, University of Texas.
WILLIAM Z. RIPLEY, Harvard University.
BENJAMIN H. RIPTON, Union College.
ALBERT SHAW, Review of Reviews.
VLADIMIR SIMKHOVITCH, Columbia University.
ALBION W. SMALL, University of Chicago.
DELOS DEWOLF SMYTH, Hamilton College.
JOHN L STEWART, Lehigh University.
ALFRED H. STONE, Greenville, Miss.
FRANK W. TAUSSIG, Harvard University.
CHARLES A. TUTTLE, Wabash College.
THOMAS K. URDAHL, Colorado College.
FRANCIS WALKER.
LESTER F. WARD, Smithsonian Institute.
ADNA F. WEBER, New York Bureau of Labor Statistics.
HORACE WHITE, New York Evening Post.
GEORGE R. WICKER, Dartmouth College.
ALLYN A. YOUNG, Adelbert College.

Term of office expiring in 1906.

LYMAN ABBOTT, The Outlook.
THOMAS S. ADAMS, University of Wisconsin.
MORTON A. ALDRICH, Tulane University.
ABRAM P. ANDREW, Harvard University.
GEORGE E. BARNETT, Johns Hopkins University.
EDWARD W. BEMIS, Cleveland, Ohio.
RICHARD B. BOWKER, New York City.
ROELIFF M. BRECKENRIDGE, West Hamilton, Ontario.
CHARLES J. BULLOCK, Harvard University.
GUY S. CALLENDER, Bowdoin College.
THOMAS N. CARVER, Harvard University.
FREDERICK A. CLEVELAND, New York City.
CHARLES A. CONANT, Morton Trust Co., New York City.
EDWARD CUMMINGS, Cambridge, Mass.
JOHN P. CUSHING, New Haven, Conn.
WINTHROP M. DANIELS, Princeton University.
DAVIS R. DEWEY, Massachusetts Institute of Technology.
FRANK H. DIXON, Dartmouth College.
E. DANA DURAND, Harvard University.
CHARLES E. EDGERTON, Washington, D. C.
CHARLES S. FAIRCHILD, New York City.
FRANK A. FETTER, Cornell University.
WILLARD C. FISHER, Wesleyan University.
A. W. FLUX, McGill University.

J. Dorsey Forrest, Butler College.
William W. Folwell, University of Minnesota.
John E. George, Northwestern University.
John M. Glenn, Baltimore, Md.
David I. Green, Hartford, Conn.
Jacob L. Green, Hartford, Conn
George Gunton, Institute of Social Economics.
Arthur T. Hadley, Yale University.
James H. Hamilton, Syracuse University.
Matthew B. Hammond, University of Illinois.
Henry R. Hatfield, University of Chicago.
Jeremiah W. Jenks, Cornell University.
George W. Knight, Ohio State University.
Samuel M. Lindsay, University of Pennsylvania.
Isaac A. Loos, Iowa State University.
James A. MacLean, University of Idaho.
John J. McNulty, College of the City of New York.
Theodore Marburg, Baltimore, Md.
Charles W. Mixter, Harvard University.
Henry L. Moore, Columbia University.
Simon Newcomb, Washington, D. C.
Victor Rosewater, Omaha Bee.
Leo S. Rowe, University of Pennsylvania.
Frederick W. Sanders, Leipzig, Germany.
Edwin R. A. Seligman, Columbia University.
Mary Roberts Smith, Stanford University.
Graham Taylor, Chicago, Ill.
W. G. Langworthy Taylor, University of Nebraska.
Charles W. Tooke, Syracuse University.
Edson N. Tuckey, Yale University.
D. Collin Wells, Dartmouth College.
Nathan A. Weston, University of Illinois.
Robert H. Whitton, New York State Library.
Stuart Wood, Philadelphia, Pa.

Term of office expiring in 1907.

Henry C. Adams, University of Michigan.
J. H. Arnold, Redfield, South Dakota.
William B. Bailey, Yale University.
James W. Black, Colby University.
Ernest L. Bogart, Oberlin University.
John B. Clark, Columbia University.
Katharine A. Coman, Wellesley College.
John R. Commons, Civic Federation, New York.
Charles H. Cooley, University of Michigan.
John Cummings, University of Chicago.

ARTHUR M. DAY, New York City.
HENRY CROSBY EMERY, Yale University.
WASHINGTON GLADDEN, Columbus, Ohio.
JOHN H. GRAY, Northwestern University.
FREDERICK B. HAWLEY, New York City.
GEORGE K. HOLMES, U. S. Department of Agriculture.
FREDERICK C. HOWE, Cleveland, Ohio.
CHARLES H. HULL, Cornell University.
JOHN HYDE, Washington, D. C.
ALVIN S. JOHNSON, Columbia University.
DAVID KINLEY, University of Illinois.
MARTIN A. KNAPP, Interstate Commerce Commission.
HENRY W. LAMB, Brookline, Mass.
JAMES E. LEROSSIGNOL, University of Denver.
CHARLES W. MACFARLANE, Philadelphia, Pa.
FREDERICK W. MOORE, Vanderbilt University.
HARRY T. NEWCOMB, Wayne, Pa.
J. PEASE NORTON, New Haven, Conn.
SIMON N. PATTEN, University of Pennsylvania.
WILLIAM R. PATTERSON, Tenement House Department, N. Y.
EDWARD T. PETERS, U. S. Department of Agriculture.
CARL C. PLEHN, University of California.
JESSE E. POPE, University of Missouri.
HARRY H. POWERS, Boston, Mass.
WILLIAM A. RAWLES, Indiana University.
GEORGE E. ROBERTS, Washington, D. C.
MAURICE H. ROBINSON, University of Illinois.
EDWARD A. ROSS, University of Nebraska.
FRANK R. RUTTER, Washington, D. C.
JOHN C. SCHWAB, Yale University.
WILLIAM A. SCOTT, University of Wisconsin.
HENRY R. SEAGER, Columbia University.
ERNEST A. SMITH, Allegheny College.
OLIVER M. W. SPRAGUE, Harvard University.
WORTHY P. STERNS, Bureau of Statistics, U. S. Treasury Dept.
FRED M. TAYLOR, University of Michigan.
THORSTEIN B. VEBLEN, University of Chicago.
G. O. VIRTUE, Winona, Minn.
C. S. WALKER, Massachusetts Agricultural College.
ULYSSES G. WEATHERLY, Indiana University.
MAX WEST, Brooklyn, N. Y.
ALBERT C. WHITAKER, Stanford University.
WALTER F. WILLCOX, Cornell University.
H. PARKER WILLIS, Washington and Lee University.
WILLIAM F. WILLOUGHBY, U. S. Department of Labor.
CARROLL D. WRIGHT, U. S. Department of Labor.
WALTER A. WYCKOFF, Princeton University.

LIST OF MEMBERS

* Life Members † Subscribers ° Honorary Members

ABBOTT, LYMAN, *The Outlook*, 287 Fourth Avenue, New York City.
ABRATANI, J., 700 Park Avenue, New York City.
ADAM, J. N., Buffalo, N. Y.
ADAMS, BROOKS, Quincy, Mass.
ADAMS, CHARLES FRANCIS, South Lincoln, Mass.
ADAMS, HENRY CARTER, Prof., Univ. of Mich., Ann Arbor, Mich.
ADAMS, THOMAS S., Ass't Prof., Univ. of Wis., Madison, Wis.
ADAMS, WILLIAM W., 111 June Street, Fall River, Mass.
†ADELBERT COLLEGE, Cleveland, O.
ADRIANCE, W. F., Yale Univ., New Haven, Conn.
AGGER, EUGENE, 523 W. 124th Street, New York City.
AILES, MILTON E., Treasury Dept., Washington, D. C.
†ALBION COLLEGE, Albion, Mich.
ALDRICH, MORTON ARNOLD, Prof., Tulane Univ., New Orleans, La.
†ALFRED UNIVERSITY READING ROOM, Alfred, N. Y.
ALLEN, GEORGE HENRY HOWLAND, New Bedford, Mass.
ALLEN, JOHN ROBERT, Georgetown, Texas.
ALLEN, WALTER S., New Bedford, Mass.
ALLEN, WILLIAM F., South Orange, N. J.
*ALVORD, WILLIAM, 400 California Street, San Francisco, Cal.
AMES, C. H., 110 Boylston Street, Boston, Mass.
†AMHERST COLLEGE, Amherst, Mass.
ANDREW, ABRAM PIATT, Jr., 10 Russell Hall, Cambridge, Mass.
ANDREWS, ELISHA BENJAMIN, Chancellor of the Univ. of Neb., Lincoln, Neb.
*ARMSTRONG, H. C., Jr., Pensacola, Fla.
ARMSTRONG, COLLIN, 25 Broad Street, New York City.
ARNOLD, J. H., Prof., Redfield, S. D.
ATKINSON, EDWARD, Brookline, Mass.
AUSTIN, O. P., Bureau of Statistics, Treasury Dept., Washington, D. C.
*AVERY, ELROY MCKENDREE, 657 Woodlands Hills Avenue, Cleveland, Ohio.
AVERS, EDWARD E., North Andover Depot, Mass.
BACON, MARSHALL L., Tarrytown, N. Y.
BACON, NATHANIEL T., Peace Dale, R. I.
BAILEY, WILLIAM B., 22 Linwood Street, New Haven, Conn.
BAKER, CHARLES WHITING, *Engineering News*, 220 Broadway, New York City.

BAKER, HENRY D., Exmoor Cottage, Highland Park, Ill.
BAKER, MOSES NELSON, *Engineering News*, 220 Broadway, New York City.
BALCH, (Miss) EMILY G., Prince Street, Jamaica Plain, Mass.
BALDWIN, FOY SPENCER, Prof., Boston Univ., 12 Somerset Street, Boston, Mass.
*BALDWIN, SIMEON EBEN, 69 Church Street, New Haven, Conn.
*BALDWIN, SUMMERFIELD, 1006 Charles Street, Baltimore, Md.
*BALDWIN, WILLIAM HENRY, Jr., Pres., Long Island R. R. Co., 128 Broadway, New York City.
BANKS, E. M., 227 W. 122d Street, New York City.
BARKLEY, RICHARD W., 220 Broadway, New York City.
BARNES, WILLIAM EDDY, Editor of *Age of Steel*, St. Louis, Mo.
BARNETT, GEORGE E., Johns Hopkins Univ., Baltimore, Md.
BARNETT, DON CARLOS, Prof., Haverford, Pa.
BARROWS, CHARLES H., Springfield, Mass,
BASSETT, JOHN S., Trinity College, Durham, N. C.
BATCHELLER, (Mrs.) ALFRED H., 55 Commonwealth Avenue, Boston, Mass.
BATCHELLER, ROBERT, North Brookfield, Mass.
†BATES COLLEGE, Lewiston, Me.
BAXTER, SYLVESTER, 32 Murray Street, Malden, Mass.
BEARD, J. N., 129 Haight Street, San Francisco, Cal.
BEARDSLEY, CHARLES, 378 Harvard Street, Cambridge, Mass.
BECHER, FRANKLIN A., 406 Irving Place, Milwaukee, Wis.
BECKHARD, M., 52 William Street, New York City.
BEER, GEORGE LOUIS, 65 Pine Street, New York City.
BEER, WILLIAM, Howard Memorial Library, New Orleans, La.
BELLER, WILLIAM F., 55 E. 112th Street, New York City.
BEMIS, EDWARD WEBSTER, 178 Kensington Street, Cleveland, O.
BENNETT, J. M., The Wyandotte, Columbus, O.
BERARD, EUGENE M., 7 Nassau Street, New York City.
BERRYHILL, JAMES G., 1101 Pleasant Street, Des Moines, Ia
BIGELOW, N. P., 308 Tacoma Building, Chicago, Ill.
BILGRAM, HUGO, corner 12th and Noble Streets, Philadelphia, Pa.
BILLQUIST, C. EDWARD, 11 Broadway, New York City.
*BIXBY, WILLIAM HERBERT, U S. Engineer Office, Jones Building, Detroit, Mich.
BLACK, JOHN WILLIAM, Prof., Colby College, 4 Dalton Street, Waterville, Me.
BLACKMAN, WILLIAM FREEMONT, Pres., Rollins College, Winter Park, Fla.
BLACKMAR, FRANK W., Prof., Kansas State Univ., Lawrence, Kan.
BLAIR, JAMES L., Union Trust Building, St. Louis, Mo.
BLANCHARD, NATHAN W., Santa Paula, Cal.
BLETHEN, Col. A. J., *The Times*, Seattle, Wash.
BLOOD, JOHN BALCH, 10 Post Office Square, Boston, Mass.

Bocock, Rev. Kemper, 321 S. 13th Street, Philadelphia, Pa.
Bodine, Samuel T., Broad and Arch Streets, Philadelphia, Pa.
°Bodio, Luigi, Prof., Rome, Italy.
Boerner, Arthur R., Cedarburg, Wis.
Bogart, Ernest Ludlow, Prof., Oberlin, O.
°Böhm-Bawerk, Eugen, Prof., III Beatrix Gasse, 14B, Vienna, Austria.
Boissevain, G. M., 4 Tesselchade-stratt, Amsterdam, Holland.
Bolles, Albert S., Prof., Haverford College, Haverford, Pa.
Bonn, Max, 30 Broad Street, New York City.
Borg, Sidney C., 20 Nassau Street, New York City.
†Boston Athenæum, Beacon Street, Boston, Mass.
†Boston Public Library, Boston, Mass.
†Bowdoin College, Brunswick, Me.
*Bowen, Clarence Winthrop, *The Independent*, 251 Broadway, New York City.
Bowen, J. Chester, Bureau of Labor, Washington, D. C.
*Bowker, Richard Rogers, *Publisher's Weekly*, 31 and 32 Park Row, New York City.
Breckenridge, Roeliff Morton, 216 Jackson Street, W. Hamilton, Ontario.
Breed, W. J., 408 Pike Street, Cincinnati, O.
Bridges, Robert, Orillia, King Co., Wash.
Bright, George W., Pres., Boomer Coal and Coke Co., Columbus, Ohio.
Brohough, G. O , Prof., Red Wing, Minn.
Bronson, Samuel L., New Haven, Conn.
†Brooklyn Library, Montague Street, Brooklyn, N. Y.
Brooks, John Graham, 8 Ash Street, Cambridge, Mass.
Brooks, Robert C., Instructor, Cornell Univ., Cascadilla Place, Ithaca, N. Y.
*Brough, William, New Hamburg, N. Y.
Brown, Nelson P., 38 Oakes Street, Everett, Mass.
Brown, R. L., Austin, Texas.
Brown, Thomas Edwin, 1035 Liberty Street, Franklin, Pa.
†Brown University, Providence, R. I.
Browne, G. Morgan, 44 Pine Street, New York City.
Bruce, Robert C., Director Tuskegee Institute, Tuskegee, Ala.
Brummer, Leon, 7 Pine Street, New York City.
†Bryn Mawr College, Bryn Mawr, Pa.
Buckler, William, W. North Avenue, Baltimore, Md.
†Bucknell University, Lewisburg, Pa.
†Buffalo Public Library, Buffalo, N. Y.
Bullock, Charles Jesse, Prof., Harvard Univ., Cambridge, Mass.
Bunnell, J. S., San Francisco, Cal.
†Bureau of Education, Washington, D. C.

BURGESS, JOHN WILLIAM, Prof., Columbia Univ., 323 W. 57th Street, New York City.
BURKE, WILLIAM MAXWELL, Albion College, Albion, Mich.
BUTLER, HERMAN B., 18 Milwaukee Avenue, Chicago, Ill.
†BUTTE CITY FREE PUBLIC LIBRARY, Butte City, Mont.
BUTTERFIELD, KENYON L. Kingston, R. I.
CALDWELL, HOWARD WALTER, Prof., Univ. of Neb , 511 N. 16th Street, Lincoln, Neb.
†CALIFORNIA STATE LIBRARY, Sacramento, Cal.
†CALIFORNIA, UNIVERSITY, Berkeley, Cal.
CALLENDER, GUY STEPHENS, 716 Divinity Hall, New Haven, Conn.
CAMPBELL, NORMAN M., Colorado Springs, Col.
CANADIAN DEPUTY MINISTER OF LABOR, Ottawa, Ontario, Canada.
†CANADIAN LIBRARY OF PARLIAMENT, Ottawa, Canada.
*CARNEGIE, ANDREW, 5 W. 51st Street, New York City.
†CARNEGIE FREE LIBRARY, Allegheny, Pa.
†CARNEGIE LIBRARY, Pittsburg, Pa.
CARPENTER, GEORGE O., Russell and Compton Avenues, St. Louis, Mo.
CARVER, THOMAS NIXON, Prof., Harvard Univ., 16 Kirkland Road, N. Cambridge, Mass.
CASSOT, ARTHUR, Manager Manhattan Press Clipping Bureau, 2 W. 14th Street, New York City.
CATOR, GEORGE, 803 St. Paul Street, Baltimore, Md.
CATT, GEORGE W., 2407 Park Row Building, New York City.
†CEDAR RAPIDS FREE PUBLIC LIBRARY, Cedar Rapids, Iowa.
CHANDLER, ALFRED D., Brookline, Mass.
CHANDLER, JAMES E., Old Orchard, Me.
CHAPIN, ROBERT COIT, Prof., Beloit College, Beloit, Wis.
CHASE, HARVEY S., 8 Congress Street, Boston, Mass.
CHASE, SIMEON B., King Philip's Mills, Fall River, Mass.
CHASNOFF, JACOB, 10 Lathrop Hall, Columbia, Mo.
CHICAGO CITY CLUB, 180 Madison Street, Chicago, Ill.
†CHICAGO LAW INSTITUTE, County Building, Chicago, Ill.
†CHICAGO PUBLIC LIBRARY, Chicago, Ill.
†CHIYOZO, OTSUKA, 24 Chiyodacho, Kanda-ku, Tokio, Japan.
†CINCINNATI PUBLIC LIBRARY, Cincinnati, O.
†CINCINNATI, UNIVERSITY, Cincinnati, O.
CLAGHORN, (Miss) K. HOLLADAY, 81 Columbia Heights, Brooklyn, N. Y.
CLARK, Miss JEANNETTE A., Winona, Minn.
CLARK, JOHN BATES, Prof., Columbia Univ., 616 West 113th Street, New York City.
*CLARK, JOHN SPENCER, Secy., Prang Educational Co., 110 Boylston Street, Boston, Mass.
*CLARK, MARTIN, 91 Erie Co. Bank Building, Buffalo, N. Y.
CLARK, W. E., 75 Washington Place, New York City.

†Clark University Library, Worcester, Mass.
Clarke, Enos, Kirkwood Station, St. Louis, Mo.
Clarke, William Newton, Prof., Colgate Univ., Hamilton, N. Y.
Cleveland, F. A., 30 Broad St., New York City.
†Cleveland Public Library, Cleveland, O.
Clow, Frederick Redman, Prof., State Normal, Oshkosh, Wis.
Coe, William T., Temple Court, Minneapolis, Minn.
Cohn, Morris M., Little Rock, Ark.
°Cohn, Gustav, Prof., Göttingen, Germany.
Colby, Frank Moore, Prof. and Editor, University Heights, New York City.
Coler, Bird S., 280 Broadway, New York City.
Coles, Lewis E., Norman, Okl.
Collin, Charles Avery, 32 Nassau Street, New York City.
†Colorado, University, Boulder, Col.
†Columbus Public Library, Columbus, O.
Coman, Katharine, Prof., Wellesley College, Wellesley, Mass.
Commons, John Rogers, 281 Fourth Ave., New York City.
Conant, Charles A., Morton Trust Co., New York City.
Conant, Leonard H., 30 Broad Street, New York City.
Conner, J. E., Univ. of Penn., Philadelphia, Pa.
°Conrad, Johannes, Prof., Univ. of Halle, Halle a/S. Germany.
†Consumer's League, 105 E 22d Street, New York City.
*Cook, Charles C., 2222 6th Street, N. W , Washington, D. C.
Cook, Howard Hamblett, M.D., 71 City Hall, Boston, Mass.
Cooley, Charles Horton, Prof., Univ. of Mich., Ann Arbor, Mich.
Cooley, Edwin Gilbert, Supt. of Schools, Schiller Building, Chicago, Ill.
Coolidge, Thomas Jefferson, 64 Ames Building, Boston, Mass.
Cooper, A. R., Galt House, Louisville, Ky.
Cowdery, Edward G., Milwaukee, Wis.
Crafts, (Miss) Lettie M., Asst. Librarian, Univ. of Minn., Minneapolis, Minn.
Crane, C. R., 2559 Michigan Avenue, Chicago, Ill.
Crocker, George Glover, 1016–1023 Old South Building, Boston, Mass.
Crook, James Walter, Prof., Amhers' College, Amherst, Mass.
Crosby, John Sherwin, 335 W. 14th Street, New York City.
Crouter, A. L. Edgerton, Pa. Institute for the Deaf and Dumb, Mt. Airy, Philadelphia, Pa.
Crowell, John Franklin, Bureau of Statistics, Treasury Dept., Washington. D. C.
Crum, Fred Stephen, Prudential Insurance Co., Newark, N. J.
Crunden, Frederick Morgan, Public Library, St. Louis, Mo.
Cummings, Edward, Prof., Harvard Univ., 104 Irving Street, Cambridge, Mass.

CUMMINGS, JOHN, Prof., Univ. of Chicago, Chicago, Ill.
CURRAN, JAMES HARRIS, Tome Inst., Port Deposit, Md.
CURTIS, CHARLES EDWARD, City Bank of New Haven, New Haven, Conn.
CUSHING, JOHN PEARSONS, Prof., New Haven, Conn.
CUTTING, R. FULTON, 32 Nassau Street, New York City.
DABNEY, RICHARD HEATH, Prof., Univ. of Va., Charlottesville, Va.
DA COSTA, JOSÉ S., L.L.D., Ca Garantia da Amazonia, Pará, North of Brazil.
DAISH, JOHN BROUGHTON, Station B, Washington, D. C.
DANIELS, WINTHROP MORE, Prof., Princeton Univ., Princeton, N. J.
DART, H. P., 5931 St. Charles Avenue, New Orleans, La.
*DAVIS, ANDREW MCFARLAND, Antiquarian, 10 Appleton Street, Cambridge, Mass.
DAVIS, EDWARD H., 119 Columbia Street, West LaFayette, Ind.
*DAVIS, HORACE, 1800 Broadway, San Francisco, Cal.
DAVIS, JOHN, Pres., Detroit Chemical Works, 515 Cass Avenue, Detroit, Mich.
DAVIS, JOHN W., Prin. of Public School 8, Borough of Bronx, New York City.
DAVIS, MICHAEL M., 244 W. 104th Street, New York City.
DAVIS, SAMUEL A., Danbury, Conn.
DAY, ARTHUR MORGAN, 52 William Street, New York City.
DAY, FRANCIS A., Springfield, Mass.
*DEAN, CHARLES A., Dean Building, 60 India Street, Boston, Mass.
DEFOREST, ROBERT W., 7 Washington Square, New York City.
DEMPSEY, J. HARRY, Census Office, Washington, D. C.
†DENISON UNIVERSITY, Granville, O.
DENNY, CHARLES L., Dexter Horton Bank Building, Seattle, Wash.
DETRICK, CHARLES R., Stanford University, Cal.
†DETROIT PUBLIC LIBRARY, Detroit, Mich.
DEVINE, EDWARD THOMAS, Circuit Road, New Rochelle, N. Y.
DEWEY, DAVIS RICH, Prof., Mass. Inst. of Technology, Boston.
DEXTER, SEYMOUR, Elmira, N. Y.
DICKMAN, J. W., Upper Iowa Univ., Fayette, Iowa.
*DILL, ARTHUR C., 821 Cleveland Avenue, Niagara Falls, N. Y.
*DILL, JAMES BROOKS, 27 Pine Street, New York City.
DIXON, FRANK HAIGH, Prof., Dartmouth College, Hanover, N. H.
*DODD, SAMUEL C. T., 26 Broadway, New York City.
DODGE (Miss) GRACE HOADLEY, 262 Madison Avenue, New York City.
DODGE, RAYMOND E., Publisher *Money and Credit*, 25 Broad Street, New York City.
DODGE, WILLIAM EARL, 11 Cliff Street, New York City.
DONALD, MALCOLM, 70 State Street, Boston, Mass.
DONNELLE, F. C., Maryville, Mo.

DOTEN, CARROLL W., Mass. Inst. of Technology, 1541 Cambridge Street, Cambridge, Mass.
DOUGHERTY, M. ANGELO, Cambridge, Mass.
DOUTHIRT, W. F., Box 72, Glen Ridge, N. J.
†DREXEL INSTITUTE LIBRARY, Philadelphia, Pa.
DROPPERS, GARRETT, Pres. Univ. of S. D., Vermillion, S. D.
DUBRUL, ERNEST F., Union Trust Building, Cincinnati, O.
DUDLEY, CHARLES BENJAMIN, Drawer 334, Altoona, Pa.
DUNBAR, R. E., 3 Odd Fellows' Block, South Bend, Ind.
DURAND, EDWARD DANA, 1303 Columbia Road, Washington, D.C.
DURHAM, EZRA D., Onarga, Ill.
DYER, G. W., Instructor, Vanderbilt Univ., Nashville, Tenn.
DYNES, JOHN HOWARD, 1305 30th Street, Washington, D.C.
EASLEY, RALPH M., Secretary of the Civic Federation, 281 Fourth Avenue, New York City.
EATON, J. SHIRLEY, Havemeyer Building, New York City.
ECCLESTON, J. H., 910 St. Paul Street, Baltimore, Md.
*EDDY, (Miss) SARAH J., 4 Bell Street, Providence, R. I.
EDGERTON, CHARLES EUGENE, 80 V Street, N. W., Washington, D. C.
°EDGEWORTH, FRANCIS YSIDRO, Prof., Baliol College, Oxford, England.
EDMONDS, FRANKLIN SPENCER, Central High School, Philadelphia, Pa.
EDMONDS, JAMES E., *Times-Democrat*, New Orleans, La.
EDWARDS, C. W., Trinity College, Durham, N. C.
ELIASON, ADOLPH O., Montevideo, Minn.
ELKINS, STEPHEN BENTON, Elkins, W. Va.
ELLWOOD, CHARLES A., Prof., Univ. of Mo., Columbia, Mo.
ELY, RICHARD THEODORE, Prof., Univ. of Wis., Madison.
ELY, ROBERT ERSKINE, 23 W. 44th Street, New York City.
EMERY, HENRY CROSBY, Prof., Yale Univ., New Haven, Conn.
†ENOCH PRATT FREE LIBRARY, Reading Room, Baltimore, Md.
ERICKSON, HALFORD, Commissioner of Labor Statistics, Madison, Wis.
EVANS, NELSON W., Portsmouth, O
EWING, JOHN GILLEPSIE, Notre Dame, Ind.
FAIRCHILD, A. B., Crete, Neb
*FAIRCHILD, CHARLES STEBBINS, 76 Clinton Place, New York City.
FAIRCHILD, F. R., Yale Univ , New Haven, Conn.
FAIRLIE, JOHN ARCHIBALD, 524 S. State Street, Ann Arbor, Mich.
FALKNER, ROLAND POST, Chief of Department of Documents, Library of Congress, Washington, D. C.
FARNHAM, (Miss) ANNA LOIS, Bryn Mawr, Pa.
FARNAM, HENRY WALCOTT, Prof., Yale Univ., 43 Hillhouse Avenue, New Haven, Conn.
FARQUHAR, ARTHUR B., York, Pa.

FARQUHAR, HENRY, Assistant Statistician, Census Office, Washington, D. C.

FARWELL, JOHN, Jr., 148 Market Street, Chicago, Ill.

FAST, RICHARD ELLSWORTH, Prof., Univ. of W. Va , Morgantown, W. Va.

FELTER, WM. L , 996 Sterling Place, Brooklyn, N. Y.

FERGUSON, HENRY, Prof., Trinity College, 123 Vernon Street, Hartford, Conn.

*FERGUSON, WILLIAM C., Richmond, Ind.

FETTER, FRANK ALBERT, Prof., Cornell Univ., Ithaca, N. Y.

FIELDER, GEORGE L., 255 W. 95th Street, New York City.

FILENE, EDWARD A., 453 Washington Street, Boston, Mass.

FILLEBROWN, C. B., 68 Essex Street, Boston, Mass.

FINLEY, JOHN HUSTON, Prof., Princeton Univ., Lawrenceville, N. J.

FISHBACK, JOHN HOWARD, Interstate Commerce Commission, Washington, D. C.

FISHER, F. COLQUHOUN, 746 W. North Avenue, Baltimore, Md.

FISHER, GEORGE HARRISON, 308 Walnut Street, Philadelphia, Pa.

FISHER, IRVING, Prof., Yale Univ., New Haven, Conn

FISHER, WILLARD CLARK, Prof , Wesleyan Univ., Middletown, Conn.

FISK, GEORGE M., Prof., 906 W. California Avenue, Urbana, Ill.

FITZGERALD, (Mrs.) R. Y., Mgr. West Side Branch, 38 King Street, New York City.

FLOWER, FRANK A., Census Office, Washington, D. C.

FLUX, A. W., Prof., McGill Univ., Montreal, Canada.

FOLKS, HOMER, Genl. Sec'y. Nat. Conf. of Charities and Corrections, 19 E. 88th Street, New York City.

FOLWELL, WILLIAM WATTS, Prof., Univ. of Minn., Minneapolis, Minn.

†FORBES LIBRARY, Northampton, Mass.

*FOOTE, ALLEN RIPLEY, Editor *Public Policy*, 625 Home Insurance Bldg., Chicago, Ill.

FORD, HENRY J., Editor *Pittsburg Gazette*, Pittsburg, Pa.

FORD, WORTHINGTON CHAUNCEY, Library of Congress, Washington, D. C.

FORREST, J. DORSEY, Prof., Butler College, Indianapolis, Ind.

*FOSTER, E. H., Prof., Glendale, O.

FRADENBURGH, ADELBERT GRANT, Adelphi College, Brooklyn.

FRANKENHEIMER, JOHN, 25 Broad Street, New York City.

FRANKLAND, FRED WILLIAM, 346 Broadway, New York City.

FRANKLIN, FABIAN, Prof., 1507 Park Avenue, Baltimore, Md.

FRASER, ALEXANDER HUGH ROSS, Boardman Hall, Ithaca, N. Y.

FREEHOFF, J. C., 415 W. 118th Street, New York City.

FREEMAN, HARRISON, B., Jr., 50 State Street, Hartford, Conn.

FREER, HAMLINE H., Prof., Cornell College, Mt. Vernon, Iowa.

FRENYEAR, THOMAS C., Lawlor Building, King and Yonge Streets, Toronto, Canada.
FRIEDENWALD, HERBERT, 615 N. 16th Street, Philadelphia, Pa.
†FRIEDLEIN, D. E., Krakau, Austria.
*FULLER, PAUL, 68 William Street, New York City.
FURBER, HENRY JEWETT, Jr., 659 The Rookery, Chicago, Ill.
GAHAN, WILLIAM J., Whitecastle, Iberville Parish, La.
†GALESBURG PUBLIC LIBRARY, Galesburg, Ill.
GANNETT, HENRY, U. S. Geological Survey, Washington, D. C.
GARDNER, HENRY BRAYTON, Prof., Brown Univ., 54 Stimson Avenue, Providence, R. I.
GARFIELD, HARRY A., Garfield Building, Cleveland, O.
GARRARD, JEPHTHAH, 44 Johnston Building, Cincinnati, O.
GARRISON, GEORGE PIERCE, Prof., Univ. of Texas, Austin, Tex.
GARTZ, A. F., Lake Geneva, Wis.
GAULT, FRANKLIN B., 607 N. I Street, Tacoma, Wash.
GAVIN, FRANK E., 902 Majestic Street, Indianapolis, Ind.
GEORGE, JOHN EDWARD, Prof., Northwestern Univ., Evanston, Ill.
†GEORGIA, UNIVERSITY, Athens, Ga.
GERLING, HENRY JOSEPH, 3936 Page Avenue, St. Louis, Mo.
GHENT, WILLIAM JAMES, 260 W. 54th Street, New York City.
GIDDINGS, FRANKLIN HENRY, Prof., Columbia Univ., 150 W. 79th Street, New York City.
*GIDE, CHARLES, Prof., Univ. of Montpellier, Montpellier, France.
GILMAN, NICHOLAS PAINE, Editor *The New World*, Meadville, Pa.
GILSON, N. S., Madison, Wis.
GLADDEN, WASHINGTON, Columbus, O.
GLASSON, WILLIAM H., Trinity College, Durham, N. C.
GLENN, JOHN M., 617 Columbia Avenue, Baltimore, Md.
GLESSNER, J. J., care Warden, Bushnell and Glessner Company, Chicago, Ill.
GLICKSMAN, NATHAN, 448 Kenilworth Place, Milwaukee, Wis.
GOODELL, EDWIN B., Montclair, N. J.
†GOODELL, HENRY HILL, Pres. Mass. Agricultural College, Amherst, Mass.
GOODNOW, FRANK JOHNSON, Prof., Columbia Univ., New York City.
GOULD, ELGIN RALSTON LOVELL, 281 Fourth Avenue, New York City.
GOVE, WILLIAM HENRY, P. O. Building, Salem, Mass.
GOWDEY, CLINTON, 5 Elm Street, Springfield, Mass.
GRAETZ, VICTOR, Hansengasse 6, Vienna, Austria.
†GRAND PRAIRIE SEMINARY LIBRARY, Onarga, Ill.
†GRAND RAPIDS PUBLIC LIBRARY, Grand Rapids, Mich.
GRANT, FRANCIS W., Seattle, Wash.
GRAY, JOHN CHIPMAN, 50 State Street, Boston, Mass.
GRAY, JOHN HENRY, Prof., Northwestern Univ., Evanston, Ill.

Greely, Otto E., 104 Phoenix Building, Minneapolis, Minn.
*Green, David I., Hartford, Conn.
Green, Jacob L., Hartford, Conn.
Greene, Frank, Care Bradstreets, 61 Elm Street, New York City.
Greene, John, 61 Elm Street, New York City.
Greene, Thomas Lyman, 43 Cedar Street, New York City.
*Grey, Earl Albert, Howick, Lesbury, Northumberland, England.
Griffin, Charles S., Imperial Univ., Tokio, Japan.
Groat, George G., 430 W. 118th Street, New York City.
Groton, W. M., The Dean's House, Woodland Avenue and Fiftieth Street, Philadelphia, Pa.
*Gulick, John Thomas, Oberlin, O.
Gulick, Luther, 236 Willoughby Avenue, Brooklyn, N. Y.
Gundaker, H. City, 3421 Walnut Street, Philadelphia, Pa.
Gunton, George, Pres., Institute of Social Economics, 41 Union Square, New York City.
Hadley, Arthur Twining, Pres. Yale Univ., New Haven, Conn.
Hagerty, James E., Ohio State Univ., Columbus, O.
Halle, Ernst von, Prof., 30 Achenbachstrasse 2, Berlin W., Germany.
Halsey, John Julius, Prof., Lake Forest, Ill.
Hamilton, C. J., Blackladies, Dinas Powis, Cardiff, Wales.
Hamilton, James Henry, Head Worker University Settlement, 184 Eldridge Street, New York City.
Hamlin, Charles Sumner, 2 Raleigh Street, Boston, Mass.
Hammond, John Henry, 30 Broad Street, New York City.
Hammond, Matthew Brown, Asst. Prof., 905 California Avenue, Urbana, Ill.
Hancock, James D., Franklin, Pa.
Hanger, G. W. W., Chief Clerk, Department of Labor, Washington, D. C.
*Hanks, Mrs. J. C. Stedman, 53 State Street, Boston, Mass.
Hanshue, J. J., Box 345, Lansing, Mich.
*Harding, W. E., Bethany, N. Y.
Harkness, George S., Odd Fellows Building, Stockton, Cal.
Hartwell, Edward M., City Hall, Boston, Mass.
†Harvard College Library, Cambridge, Mass.
Hatch, Leonard W., 466 A, Hamilton Street, Albany, N. Y.
Hatfield, Henry Rand, Univ. of Chicago, Chicago, Ill.
Hathaway, Frank Randel, 146 W. 90th Street, New York City.
*Hathaway, Harrison, Corner Miami and Fort Streets, Toledo, O.
Hattion, William H., New London, Wis.
Hawkins, Delmer E., Prof., Syracuse Univ., Syracuse, N. Y.
Hawley, Frederick E., 141 Pearl Street, New York City.
Hazard, F. R., Pres., Solvay Process Co., Syracuse, N. Y.
Hazard, R. S., Peace Dale, R. I.
†Hazen, Lucius B., Middletown, Conn.

HEIM, EPHRAIM M., Bucknell Univ., Lewisburg, Pa.
†HELENA PUBLIC LIBRARY, Helena, Mont.
HENDERSON, CHARLES RICHMOND, Prof., Univ. of Chicago, Chicago, Ill.
HENDERSON, HARRY B., Cheyenne, Wyoming.
HERRICK, CHEESMAN A., Central High School, Philadelphia, Pa.
HERRIOTT, FRANK I., Drake Univ., Des Moines, Iowa.
HICKS, FREDERICK CHARLES, Prof., Univ. of Cincinnati, Cincinnati, O.
HIESTER, A. V., Prof., 26 Race Avenue, Lancaster, Pa.
HILL, JOSEPH ADNA, Census Office, Washington, D. C.
HINES, WALKER D., Louisville & Nashville R. R., Louisville, Ky.
HITCHCOCK, FRANK H., Dept. of Agriculture, Washington, D. C.
HOBSON, JOHN ATKINSON, Elmstead, Limpsfield, Surrey, England.
HOLDEN, L. E., *The Plaindealer*, Cleveland, O.
HOLDSWORTH, JOHN THOM, Drexel Institute, Philadelphia, Pa.
HOLLANDER, JACOB H., Prof., Johns Hopkins Univ., Baltimore, Md.
HOLLERITH, HERMAN, 1054 31st Street, Washington, D. C.
HOLMAN, FREDERICK V., P. O. Box 504, Portland, Oregon.
HOLMES, GEORGE K., Dept. of Agriculture, Washington, D. C.
HOLT, HENRY, 29 West 23d Street, New York City.
HOPKINS, WILLIAM ROWLANDSON, 820 Society for Savings, Cleveland, O.
HORNE, PERLEY L., Prin., Dummer Academy, South Byfield, Mass.
HORTON, GUY B., North Clarendon, Vt.
HORWOOD, HENRY A., 44 Walker Street, New York City.
HOTCHKISS, WILLARD E., 713 E. State Street, Ithaca, N. Y.
HOURIGAN, JOHN, Public Accountant 45 Maiden Lane, Albany, N. Y.
HOURWICH, ISAAC, Treasury Dept. Mint Bureau, Washington, D. C.
HOUSTON, DAVID F., Prof., Univ. of Texas, 2304 San Antonio Street, Austin, Texas.
*HOUSTON, SAMUEL FREDERIC, Chestnut Hill, Philadelphia, Pa.
HOWARD, BURT ESTES, Prof., Stanford University, Cal.
HOWE, FREDERICK CLEMSON, Garfield Building, Cleveland, O.
HOWE, SAMUEL T., 1925 West Street, Topeka, Kansas.
HOWES, OSBORNE, 55 Kilby Street, Boston, Mass.
HOXIE, ROBERT F., Instructor, Cornell Univ., Ithaca, N. Y.
HUBBARD, W. P., 1421 Chapline Street, Wheeling, W. Va.
HUBBELL, HENRY LYMAN, 409 Orange Street, New Haven, Conn.
HUBERICK, C. H., Univ. of Texas, Austin, Texas.
HULL, CHARLES HENRY, Prof., Cornell Univ., Ithaca, N. Y.
HUNT, WILLIAM C., Statistical Expert, Census Office, Washington, D. C.
HUNTER, WILLIAM BOYD, Census Office, Washington, D. C.
HURD, RICHARD M., 59 Cedar Street, New York City.
HURRY, CLARENCE B., 1002 Massachusetts Avenue, Washington, D.C.

*HUTCHINSON, CHARLES HARE, 1617 Walnut Street, Philadelphia, Pa.
HUTCHINSON, LINCOLN, Univ. of Cal., Faculty Club, Berkeley, Cal.
HYDE, JOHN, Department of Agriculture, Washington, D. C.
†IKEDA, HIDEZO, 27 Masagocho, Hongo, Tokio, Japan.
*ILES, GEORGE, 5 Brunswick Street, Montreal, Canada.
†ILLINOIS, UNIVERSITY, Champaign, Ill.
†INDIANA STATE LIBRARY, Indianapolis Ind.
†INDIANA UNIVERSITY, Bloomington, Ind.
†INDIANAPOLIS PUBLIC LIBRARY, Indianapolis, Ind.
INGALLS, MELVILLE E., Pres., Big Four Railway, Cincinnati, O.
°INGRAM, JOHN KELLS, Prof., Trinity College, Dublin, Ireland.
INSULL, SAMUEL, 139 Adams Street, Chicago, Ill.
†IOWA STATE COLLEGE, Ames, Ia.
IOWA STATE LIBRARY, Des Moines, Ia,
†IOWA STATE NORMAL SCHOOL, Cedar Falls, Ia.
†IOWA STATE UNIVERSITY, Iowa City, Ia.
*IRWIN, DUDLEY M., 71 Board of Trade, Buffalo, N. Y.
ISHIZAKA, M., Aoyama College, Tokio, Japan.
JACKSON, CHARLES C., 24 Congress Street, Boston, Mass.
JACOBSON, MAURICE, Bureau of Statistics, Department of Commerce and Labor, Washington, D. C.
*JAMES, EDMUND JANES, Pres., Northwestern Univ., Evanston, Ill.
JANSCHUL, J., Prof., Moika 82, St. Petersburg, Russia.
*JAYNE, HENRY LABARRE, 503 Chestnut Street, Philadelphia, Pa.
JAYNES, ALLEN B., Tucson, Ariz.
JEFFREY, JOSEPH A., Pres., Jeffrey Mfg. Co., 581 E. Town Street, Columbus, O.
JENKS, JEREMIAH WHIPPLE, Prof., Cornell Univ., Ithaca, N. Y.
†JERSEY CITY FREE LIBRARY, Jersey City, N. J.
JEVONS, THOMAS E., 1301 Produce Exchange, New York City.
†JOHN CRERAR LIBRARY, Chicago, Ill.
†JOHNS HOPKINS UNIVERSITY, Baltimore, Md.
JOHNSON, ALVIN SAUNDERS, Columbia University, New York City.
JOHNSON, EDGAR H., Prof., Emory College, Oxford, Ga.
JOHNSON, EMORY R., Prof., Univ. of Penn., Philadelphia, Pa.
JOHNSON, FRANK S., 2521 Prairie Avenue, Chicago, Ill.
JOHNSON, JOSEPH F., Prof., New York Univ., Washington Square, New York City.
JONES, EDWARD D., Prof., Univ. of Mich., Ann Arbor, Mich.
JUDSON, FREDERICK NEWTON, 500–506 Rialto Building, St. Louis, Mo.
JUSTI, HERMAN, 355 Dearborn Street, Chicago, Ill.
†KANSAS CITY PUBLIC LIBRARY, Kansas City, Mo.
†KANSAS STATE NORMAL SCHOOL, Emporia, Kan.
†KANSAS, UNIVERSITY, Lawrence, KAN.
KASAHARA, SHO, care of B. Kasahara, 4 Akasaka, Omote 4 chome, Tokio, Japan.

KEASBEY, LINDLEY MILLER, Prof., Bryn Mawr College, Bryn Mawr, Pa.
KEITH, JOHN MEIGGS, San José, Costa Rica, Central America.
KELLER, ALBERT D., Prof., Heidelberg Univ., Tiffin, O.
*KELLER, ALBERT G., Yale Univ., New Haven, Conn.
KELLEY, JOHN F., 284 West Housatonic Street, Pittsfield, Mass.
*KELSEY, FRANCIS WILLEY, Prof., Univ. of Mich., 826 Tappan Street, Ann Arbor, Mich.
KEMMERER, EDWIN W., Treas. Dept., Manilla, P. I.
KENNADAY, PAUL, Settlement Worker, 88 Grove Street, New York City.
KENNAN, KOSSUTH KENT, 357 Kane Place, Milwaukee, Wis.
KENNEDY, J. WILMER, 2 Emmett Street, Newark, N. J.
KENNEDY, SINCLAIR, Readville, Mass.
KENNEY, E., 402 W. Lucas Street, Creston, Ia.
KENT, WM., 12 Sherman Street, Chicago, Ill.
*KEYNES, JOHN NEVILLE, 6 Harvey Road, Cambridge, England.
KEYSER, R. BRENT, 205 E. German Street, Baltimore, Md.
KIDDER, CAMILLUS G., 27 William Street, New York City.
KILLEBREW, J. B., Tobacco Expert, Nashville, Tenn.
KILPATRICK, THOMAS, 410 N. 22d Street, Omaha, Neb.
KINDER, FRANCIS SHANOR, 143 S. Perry Street, Villa Park Station, Denver, Col.
†KING, P. S. & SON, 284 Great Smith Street, Westminster, London.
KINGHORN, HENRY B., P. O. Box 748, New York City.
KINLEY, DAVID, Prof., Univ. of Ill., Champaign, Ill.
KINSMAN, DELOS O., State Normal School, Whitewater, Wis.
KIRK, WILLIAM, Johns Hopkins Univ., Baltimore, Md.
KLEENE, GUSTAV A., Prof., Trinity College, Hartford, Conn.
KLEIN, JACOB, 902 Rialto Building, St. Louis, Mo.
KNAPP, MARTIN A., Chairman, Interstate Commerce Commission, Washington, D. C.
KNIGHT, GEORGE WELLS, Prof., Ohio State Univ., Columbus, O.
KOHLER, MAX J., 115 E. 71st Street, New York City.
KUCZYNSKI, ROBERT K., Thiergartenstr. 13, Berlin, Germany.
KURSHEEDT, MANUEL AUGUSTUS, 35 Warren Street, New York City.
LADD, CHARLES E., care Ladd & Tilton, Portland, Ore.
LAMB, HENRY W., Brookline, Mass.
LATHAM, CHARLES K., 559 Cass Avenue, Detroit, Mich.
LAUGHLIN, J. LAURENCE, Prof., Univ. of Chicago, 5747 Lexington Avenue, Chicago, Ill.
LAURENCE (Miss) MARTHA E., Lake Erie College, Painesville, O.
LAUTERBACH, EDWARD, 22 William Street, New York City.
*LEA, HENRY CHARLES, 2000 Walnut Street, Philadelphia, Pa.
*LEESON, J. R., P. O. Box 2221, Boston, Mass.
†LELAND STANFORD JR. UNIVERSITY, Stanford Univ., Palo Alto, Cal.

LeRossignol, James Eduard, Prof., Univ. of Denver, University Park, Col.

°Leroy-Beaulieu, Paul, Prof., Collège de France, Paris, France.

Leslie, George D., 119 S. Tioga Street, Ithaca, N. Y.

°Levasseur, Pierre-Émile, Prof., 26 Rue Monsieur-le-Prince, Paris, France.

Lévy, Raphäel-Georges, Prof., 80 Boulevard des Courcelles, Paris, France.

Lindsay, Samuel McCune, Department of Education, San Juan, Porto Rico.

Lipman, F. L., care Wells, Fargo & Co.'s Bank, San Francisco, Cal.

Lippincott, Harold E., Surrogate's Court, County Court House, New York City.

Loeb, Isidor, Prof., Univ. of Mo., Columbia, Mo.

†Loescher and Co., Corso Umberto 307, Rome, Italy.

Loewy, Benno, 206 Broadway, New York City.

Logan, James, General Manager U. S. Envelope Company, Worcester, Mass.

Logan, Walter Seth, 58 William Street, New York City.

Looney, William Henry, Union Mutual Building, Portland, Me.

Loos, Isaac Althaus, Prof., State Univ. of Iowa, Iowa City, Iowa.

†Los Angeles Public Library, Los Angeles, Cal.

*Louchheim, Samuel K., West End Trust Building, Cor. Broad Street and S. Penn. Square, Philadelphia, Pa.

*Low, Seth, Ex-Mayor, 30 E. 64th Street, New York City.

Lowden, Frank O., 184 LaSalle Street, Chicago, Ill.

Lowry, John C., 2115 Green Street, Philadelphia, Pa.

Lyman, Arthur Theodore, P. O. Box 1717, Boston, Mass.

McCormick, Alexander A., 726 S. Johns Avenue, Pasadena, Cal.

McCormick, Harold F., 215 Dearborn Street, Chicago, Ill.

McCrea, Roswell Cheney, Brunswick, Me.

McLain, John Scudder, 1710 Dupoint Avenue S., Minneapolis, Minn.

MacLean, Francis Herbert, Suite 644 Unity Building, Chicago, Ill.

McLean, Simon James, Prof., Stanford Univ., Cal.

McMackin, John M., Commissioner of Labor Statistics, Albany, N. Y.

McNulty, John J., Prof., College of the City of New York, New York City.

McPherson, Logan G., B. & O. Central Building, Baltimore, Md.

McVey, Frank LeRond, Prof., Univ. of Minn., Minneapolis, Minn.

*McDuffie, John, The McDuffie School, 182 Central Street, Springfield, Mass.

Macfarlane, Charles William, 52d and Market Streets, Philadelphia, Pa.

Mackay, John, 25 King Street, W. Toronto, Canada.

MacLean, James Alexander, Prof., University of Idaho, Moscow, Idaho.
Macomber, A. E., 224 Spitzer Building, Toledo, O.
MacRae, Hugh, Wilmington, N. C.
MacVeagh, Franklin, 29 Wabash Avenue, Chicago, Ill.
*MacVeagh, Wayne, Brookfield Farm, Bryn Mawr, Pa.
Macy, Jesse, Prof., Iowa College, Grinnell, Iowa.
Macy, V. Everit, 68 Broad Street, New York City.
Maitland, Alexander, 14 E. 55th Street, New York City.
†Malden Public Library, Malden, Mass.
Maltbie, Milo Roy, City Hall, New York City.
*Marburg, Theodore, 14 W. Mt. Vernon Place, Baltimore, Md.
Marks, Martin A., 204 Garfield Building, Cleveland, O.
°Marshall, Alfred, Prof., Univ. of Cambridge, Cambridge, England.
†Massachusetts Institute of Technology, Boston, Mass.
†Massachusetts State Library, State House, Boston, Mass.
Matheson, Alexander E., Janesville, Wis.
Mathews, Byron C., City High School, Newark, N. J.
Mayer, Levy, care of Moran, Kraus and Mayer, Chicago, Ill.
Maynard, Archibald B., 195 Manning Street, Hillsdale, Mich.
Mead, Edwin Doak, 20 Beacon Street, Boston, Mass.
†Mechanics' Institute, San Francisco, Cal.
Meck, Alexander von, Board of Directors, Moscow and Kazan Railway, Moscow, Russia.
Meeker, Royal, 235 W. 123d Street, New York City.
†Mercantile Library, Baltimore, Md.
†Mercantile Library, Astor Place, New York City.
†Mercantile Library, Broadway and Locust Streets, St. Louis, Mo.
*Mercer, George Gluyas, Drexel Building, Philadelphia, Pa.
Merriam, A. R., Prof., Hartford Theolog. Sem., 314 Collins Street, Hartford, Conn.
Merriam, William Rush, Director of the Twelfth Census, Washington, D. C.
Merrifield, Webster, Pres., Univ. of North Dakota, University, N. D.
Merrill, Willard, 95 Prospect Avenue, Milwaukee, Wis.
Merriman, James D., 141 Broadway, New York City.
Metcalf, Henry Clayton, Tufts College, Mass.
Meyer, Balthasar Henry, Univ. of Wis., Madison, Wis.
Meyer, Hugo R, Harvard Univ., Cambridge, Mass.
Michael, Charles W., Perryman, Hartford Co., Md.
†Michigan Agricultural College, Agricultural P. O., Ingham Co., Mich.
†Michigan State Library, Lansing, Mich.
†Michigan, University, Ann Arbor, Mich.
Mikami, Yoshinaga, Kofu, Kai, Japan.

MIKKELSEN, MICHAEL ANDREW, 32 W. 123d Street, New York City.
MILLER, ADOLPH CASPER, Prof., Univ. of Cal., Berkeley, Cal.
MILLER, B. K., Jr., 102 Wisconsin Street, Milwaukee, Wis.
MILLER, FREDERICK A., 1175 Neil Avenue, Columbus, O.
MILLER, WALLACE E., Asst. Prof., Ohio State Univ., Columbus, O.
MILLION, JOHN W., Hardin College, Mexico, Mo.
MILLIS, H. A., Palo Alto, Cal.
MILLS, HERBERT ELMER, Prof., Vassar College, Poughkeepsie, N.Y.
†MILWAUKEE PUBLIC LIBRARY, Milwaukee, Wis.
†MINNEAPOLIS PUBLIC LIBRARY, Minneapolis, Minn.
†MINNESOTA, UNIVERSITY, Minneapolis, Minn.
†MISSOURI, UNIVERSITY, Columbia, Mo.
MITCHELL, JAMES E., Alma College, Alma, Mich.
MITCHELL, W. C., Univ. of Cal., Berkeley, Cal.
MIXTER, CHARLES WHITNEY, Burlington, Vt.
MOFFETT, SAMUEL E., 351 W. 114th Street, New York City.
MOIR, HENRY, 346 Broadway, New York City.
MOMSEN, HART, Census Office, Washington, D. C.
MONAGHAN, JAMES C., Univ. of Wis., Madison, Wis.
MONIN, LOUIS C., Prof., Armour Inst. of Technology, Chicago, Ill.
MOODY, JOHN, Cranford, N. J.
MOORE, FREDERICK WIGHTMAN, Prof., Vanderbilt Univ., Nashville, Tenn.
MOORE, HENRY LUDWELL, Prof., Columbia Univ., New York City.
MOORE, ROBERT, Laclede Building, St. Louis, Mo.
MORAN, THOMAS A., 4710 Vincennes Avenue, Chicago, Ill.
MORRIS, FRANK R., 301 Pleasant Street, Bennington, Vt.
MORSE, (Miss) FRANCES R., 12 Marlborough Street, Boston, Mass.
MORTON, I. W., 49 Vandeventer Place, St. Louis, Mo.
MOSELY, EDWARD AUGUSTUS, Sec'y Interstate Commerce Commission, Washington, D. C.
MOSLEY, WAYNE T., 425 Bruen Street, Madison, Wis.
MOURASSE, H. O., 24 Harukimatchi Sautchome, Tokio, Japan.
MOXOM, PHILIP S., 83 Dartmouth Terrace, Springfield, Mass.
MUHLEMAN, MAURICE LOUIS, 25 Broad Street, New York City.
MUHSE, A. C., Cornell Univ., 92 Cascadilla Place, Ithaca, N. Y.
MUNROE, JAMES P., 77–79 Summer Street, Boston, Mass.
MURPHY, CHARLES ROBERT, 665 Prairie Avenue, Decatur, Ill.
MURPHY, JAMES F., 271 Main Street, Pawtucket, R. I.
MUSSEY, HENRY R., 32 Waverly Place, New York City.
MYERS, WM. STARR, Country School, Charles Street Avenue, Baltimore, Md.
NAGEL, CHARLES, Security Building, St. Louis, Mo.
NARDIN, W. T., Columbia, Mo.
†NEBRASKA STATE LIBRARY, Lincoln, Neb.
†NEBRASKA, UNIVERSITY, Lincoln, Neb.
NEEB, CHARLES W., P. O. Box 127, Pittsburg, Pa.

NEEDHAM, CHARLES W., 1420 H Street, Washington, D. C.
NELSON, HENRY L., Prof., Williams College, Williamstown, Mass.
†NEWARK PUBLIC LIBRARY, Newark, N. J.
†NEW BEDFORD PUBLIC LIBRARY, New Bedford, Mass.
†NEWBERRY LIBRARY, Chicago, Ill.
NEWCOMB, SIMON. 1620 P Street, Washington, D. C.
NEWCOMB, HARRY TURNER, Bond Building, Washington, D. C.
†NEW HAMPSHIRE STATE LIBRARY, Concord, N. H.
NEWLIN, THOMAS, Prof., Guilford College, N. C.
†NEW YORK PUBLIC LIBRARY, 40 Lafayette Place, New York City.
†NEW YORK STATE LIBRARY, Albany, N. Y.
†NEW YORK UNIVERSITY LIBRARY, Univ. Heights, New York City.
NIELL, CHARLES, P., Prof., Catholic Univ., Washington, D. C.
NIMMO, JOSEPH, Jr., Huntington, Long Island, N. Y.
NIVEN, JOHN BALLANTINE, 30 Broad Street, New York City.
NORTH, SIMON NEWTON DEXTER, 683 Atlantic Avenue, Boston, Mass.
†NORTH CAROLINA, UNIVERSITY, Chapel Hill, N. C.
†NORTHWESTERN UNIVERSITY, Evanston, Ill.
NORTON, FRED L., 434 Tremont Building, Boston, Mass.
NORTON, J. PEASE, Yale Univ., 563 Orange Street, New Haven, Conn.
NOYES, ALEXANDER DANA, *Evening Post*, New York City.
†OBERLIN COLLEGE, Oberlin, O.
†OHIO STATE LIBRARY, Columbus, O.
†OHIO STATE UNIVERSITY, Columbus, O.
†OKLAHOMA, UNIVERSITY, Norman, Oklahoma.
OLCOTT, W. HARRY, Census Office, Agricultural Division, Washington, D. C.
OLSEN, ROBERT B., 193 St. Nicholas Avenue, New York City.
†OMAHA PUBLIC LIBRARY, Omaha, Neb.
†ONTARIO LEGISLATIVE LIBRARY, Toronto, Ont.
PAGE, EDWARD D., 238 E. 15th Street, New York City.
PAGE, THOMAS WALKER, Prof., Univ. of Texas, 1703 West Avenue, Austin, Texas.
PAINE, ROBERT TREAT, 6 Joy Street, Boston, Mass.
*PALGRAVE, ROBERT HARRY INGLIS, Belton, near Great Yarmouth, Norfolk, England.
PARK, G. A., Louisville & Nashville R. R., Louisville, Ky.
PARKER, ADELLA M., Seattle High School, Seattle, Wash.
PARKER, FRANCIS W., 1410 Marquette Building, Chicago, Ill.
PARSONS, (Mrs.) HERBERT, 112 East 35th Street, New York City.
PATTEN, SIMON NELSON, Prof., Univ. of Penn., Philadelphia, Pa.
PATTERSON, WILLIAM R., 746 St. Nicholas Avenue, New York City.
PATTON, JOHN, Jr., Grand Rapids, Mich.
*PEABODY, GEORGE FOSTER, 27 Pine Street, New York City.
†PEABODY INSTITUTE, Baltimore, Md.
PEARMAIN, SUMNER B., 53 State Street, Boston, Mass.
PEARSON, E. C., 175 Remsen Street, Brooklyn, N. Y.

PECKHAM, WHEELER HAZARD, 80 Broadway, New York City.
†PENNSYLVANIA STATE LIBRARY, Harrisburg, Pa.
†PENNSYLVANIA, UNIVERSITY, Philadelphia, Pa.
PERKINS, JACOB H., 14 Victoria Square, Clifton, Bristol, England.
PERSON, HARLOW S., Dartmouth College, Hanover, N. H.
PETERS, EDWARD T., 131 E Street, N. W., Washington, D. C.
PETTIGREW, E. S., Great Southern Hotel, Columbus, O.
†PHILADELPHIA LIBRARY, Juniper and Locust Streets, Philadelphia, Pa.
PHILLIPS, JOHN B., Boulder, Col.
*PHIPPS, LAWRENCE C., 1008 Farmers' Bank Building, Pittsburg, Pa.
PIERCE, (Miss) CAROLINE F., Wellesley College, Wellesley, Mass.
°PIERSON, N. G., Prof., The Hague, Holland.
PINCHOT, GIFFORD, 1705 Rhode Island Avenue, N. W., Washington, D. C.
PINKHAM, GEORGE RIPLEY, Headmaster, Searles' High School, Great Barrington, Mass.
†PLAINFIELD PUBLIC LIBRARY, Plainfield, N. J.
PLATT, WALTER B., 802 Cathedral Street, Baltimore, Md.
PLEHN, CARL COPPING, Prof., Univ. of Cal., Berkeley, Cal.
PLIMPTON, GEORGE A., 70 Fifth Avenue, New York City.
†POLITICAL SCIENCE CLUB OF YALE UNIVERSITY, New Haven, Conn.
†POMONA COLLEGE, Claremont, Cal.
POPE, JESSE ELIPHALET, Prof., Univ. of Mo , Columbia, Mo.
POPPLETON, WILLIAM S., Room 314 First National Bank, Omaha, Neb.
PORTER, WILLIAM H., 56 E. 67th Street, New York City.
POWERS, FRED PERRY, 1703 Rittenhouse Street, Philadelphia, Pa.
POWERS, HARRY HUNTINGTON, 201 Clarendon Street, Boston, Mass.
POWERS, LEGRAND, 3007 15th Street, N. W., Washington, D. C.
PRATT, SERENO S., 104 Cambridge Place, Brooklyn, N. Y.
†PRATT INSTITUTE FREE LIBRARY, Brooklyn, N. Y.
PRESCOTT, ARTHUR TAYLOR, Prof., Louisiana State Univ., 713 North Street, Baton Rouge, La.
PRESTON, HAROLD, Pioneer Building, Seattle, Wash.
PRICE, WILLIAM H., 87 Hammond Street, Cambridge, Mass.
†PRINCETON UNIVERSITY, Princeton, N. J. (two copies.)
PROUTY, CHARLES A., Newport, Vt.
†PROVIDENCE PUBLIC LIBRARY, Providence, R. I.
PURDY, LAWSON, Room 808, 52 William Street, New York City.
PUTNAM, (Miss) BERTHA, 335 W. 86th Street, New York City.
PUTNAM, HARRINGTON, 45 William Street, New York City.
PUTNAM, HERBERT, Library of Congress, Washington, D. C.
QUAINTANCE, H. W., High School, Lincoln, Neb.
†RADICAL CLUB, Scottdale, Pa.
RAFFALOVICH, A., 19 Avenue Hoche, Paris, France.
RAMAGE, BURR JAMES, Prof., Univ. of South, Sewanee, Tenn.

RAND, GEORGE C., Lawrence Station, N. Y.
RANDOLPH, E. F., 1212 Madison Street, Toledo, O.
RAPER, CHARLES LEE, Prof., Univ. of North Carolina, Chapel Hill, N. C.
RAWLES, WILLIAM A., Prof., Indiana Univ., Bloomington, Ind.
RAY, JOSEPH G., Unionville, Mass.
RAYMOND, JEROME HALL, Morgantown, W. Va.
RAYNER, ALBERT W., 1814 Eutaw Place, Baltimore, Md.
†REFORM CLUB, 233 Fifth Avenue, New York City.
REYNOLDS, ALLEN H., Walla Walla, Wash.
†REYNOLDS LIBRARY, Rochester, N. Y.
†RHODE ISLAND STATE LIBRARY, Providence, R. I.
RHODES, JAMES FORD, 392 Beacon Street, Boston, Mass.
RICH, JOSEPH W., Iowa City, Ia.
RICHARDSON, VICTOR P., Janesville, Wis.
RICHMOND, THOMAS C., Madison, Wis.
†RIGBY, W. C., 74 King William Street, Adelaide, South Australia
RIPLEY, WILLIAM Z., Prof., Harvard Univ., Newton Centre, Mass.
RIPPEY, CHARLES MCKAY, 607 21st Street, N. W., Washington, D. C.
RIPTON, BENJAMIN HENRY, Prof., Union College, Schenectady, N.Y.
RIVES, GEORGE L., 32 Nassau Street, New York City.
ROBBINS, FRANCIS L, 232 Fifth Avenue, Pittsburg, Pa.
ROBERTS, GEORGE E., Director of Mint, Washington, D. C.
*ROBINSON, (Mrs.) JANE BANCROFT, 425 Cass Avenue, Detroit, Mich.
ROBINSON, MAURICE HENRY, Prof., Univ. of Ill., Urbana, Ill.
ROBINSON, PHILIP A., 14 Clark Street, Brattleboro, Vt.
ROBINSON, SAMUEL ADAMS, 135 W. 22nd Street, Portland, Ore.
†ROCHESTER, UNIVERSITY, Rochester, N. Y.
ROGERS, CHARLES B., 161 Park Avenue, Utica, N. Y.
ROGERS, (Mrs.) EMMA W., 413 Orange Street, New Haven, Conn.
ROOT, LOUIS CARROLL, Sound Currency Committee, Reform Club, 46 Wall Street, New York City.
ROPES, WILLIAM LADD, Librarian of Andover Theological Seminary, Andover, Mass.
ROSENTHAL, LESSING, Suite 1007 Ft. Dearborn Building., Chicago, Ill.
ROSEWATER, VICTOR, Editor *Omaha Bee*, Omaha, Neb.
ROSS, EDWARD ALSWORTH, Prof., Univ. of Neb., Lincoln, Neb.
ROWE, LEO S., Ph.D., Asst. Prof., Univ. of Penn., Philadelphia, Pa.
RUSSELL, JOHN M., Treas., Crompton & Knowles Loom Works, Worcester, Mass.
RUSSELL, WILLIAM HEPBURN, Postal Telegraph Building, New York City.
RUTTER, FRANK ROY, U. S. Dept. of Agr., Washington, D. C.
RYDEN, OTTO G., 1947 Maple Avenue, Evanston, Ill.
RYMAN, J. H. T., Missoula, Mont.
†ST. LOUIS PUBLIC LIBRARY, St. Louis, Mo.

†St. Paul Public Library, St. Paul, Minn.
Sakolski, A. M., Johns Hopkins Univ., Baltimore, Md.
Sams, Conway W., 206 Courtland Street, Baltimore, Md.
Sanborn, John Bell, Madison, Wis.
Sanders, Prof. Frederic W., Thomas C. Clarkson Memorial School of Technology, Potsdam, N. Y.
†San Francisco News Co., 342 Geary Street, San Francisco, Cal. (2 copies.)
†San Francisco Free Public Library, City Hall, San Francisco, Cal.
*Sanger, William Carey, Sangerfield, N. Y.
Sano, Zensaku, Higher Commercial College, Tokio, Japan.
Sauter, William F., 1637 Diamond Street, Philadelphia, Pa.
Sayles, (Miss) Mary B., Tenement House Inspector, 6 Barrow Street, New York City.
Schaper, William A., Univ. of Minn., Minneapolis, Minn.
Schmidt, Louis B., High School, Webster City, Ia.
Schoff, Wilfred H., 233 S. Fourth Street, Philadelphia, Pa.
Schwab, Gustav Henry, 5 Broadway, New York City.
Schwab, John Christopher, Prof., Yale Univ., *Yale Review*, New Haven, Conn.
*Scott, Austin, New Brunswick, N. J.
Scott, William Amasa, Prof., Univ. of Wis., Madison, Wis.
Scovel, Sylvester Fithian, Pres., Univ. of Wooster, Wooster, Ohio.
Scovil, Samuel, 711 Cuyahoga Building, Cleveland, Ohio.
†Scranton Public Library, Scranton, Pa.
Scripps, James E , 598 Trumbull Avenue, Detroit, Mich.
*Scudder, Doremus, 44 Warren Avenue, Woburn, Mass.
*Seager, Henry Rogers, Prof., Columbia Univ., New York City.
Seattle Public Library, Seattle, Wash.
*Seligman, Edwin Robert Anderson, Prof., Columbia Univ., 324 W. 86th Street, New York City.
*Seligman, Isaac Newton, 36 W. 54th Street, New York City.
Shaw, Albert, Editor *The American Monthly Review of Reviews*, New York City.
Sheperd, Fred Strong, Prof., Asbury Park, N. J.
Sheppard, H. N., Home Life Insurance Co., 256 Broadway, New York City.
Shevlin, T. H., 129 Oak Grove Street, Minneapolis, Minn.
Shibley, George H., 38 B Street, N. W., Bliss Building, Washington, D. C.
Shirasu, C., care of Viscount Kuki, Kobe, Japan.
Shortt, Adam, Prof., Queen's Univ., Kingston, Ont.
Simes, William, Petersham, Mass.
Simkhovitch, Vladimir G., Columbia University, New York City.
Simpson, James Hope, care of Bank of Liverpool, Liverpool, Eng.
Sites, Clement Moore Lacey, Nanyang College, Shanghai, China.

SMALL, ALBION W., Prof., Univ. of Chicago, Chicago, Ill.
SMALLEY, HARRISON S., 820 Kingsley Street, Ann Arbor, Mich.
*SMART, WILLIAM, Lecturer on Political Economy, Queen Margaret College, Glasgow, Scotland.
SMITH, CHARLES LEE, Prof., William Jewell College, Liberty, Mo.
SMITH, DELEVAN, Lake Forest, Ill.
SMITH, EDWARD SNELL, *New Orleans Picayune*, New Orleans, La.
SMITH, ERNEST A., Allegheny College, Meadville, Pa.
*SMITH, JACOB G., 25 Winthrop Hall, Cambridge, Mass.
SMITH, J. ALLEN, Univ. of Wash., Seattle, Washington.
SMITH, (Mrs.) MARY ROBERTS, Palo Alto, Cal.
SMITH, MILTON W., P. O. Drawer 51, Portland, Oregon.
SMITH, SAMUEL G., Prof., Univ. of Minn., 125 College Avenue, St. Paul, Minn.
SMITH, SPARROW, Pres. Capital Banking and Trust Co., Sacramento, Cal.
SMITH, THOMAS GUILFORD, 9 German Insurance Building, Buffalo, N. Y.
SMYTH, DELOS DEWOLF, Prof., Hamilton College, Clinton, N. Y.
SNIDER, GUY E., 408 W. 115th Street, New York City.
SNOW, MARSHALL S., Washington Univ., St. Louis, Mo.
†SOUTH DAKOTA AGRICULTURAL COLLEGE, Brookings, S. D.
SOUTHER, CHARLES EDWARD, 128 Broadway, New York City.
†SOUTHERN, H. & Co., 140 Strand, London, W. C., England.
SOUTHWORTH, C. H., Springfield, Mass.
SPENCER, CHARLES WORTHEN, Prof., Colgate Univ., Hamilton, N. Y.
SPENCER, JOHN OAKLEY, Pres., Morgan College, Baltimore, Md.
SPENCER, (Miss) PAULINE W., 3421 Race Street, Philadelphia, Pa.
SPIEGELBERG, FREDERICK, 44 Broad Street, New York City.
SPIEGLE, G. E., 2115 N. 12th Street, Philadelphia, Pa.
SPRAGUE, OLIVER MITCHELL WENTWORTH, 21 Stoughton Hall, Cambridge, Mass.
*SPRAGUE, RUFUS F., Greenville, Mich.
†SPRINGFIELD PUBLIC LIBRARY, Springfield, Mass.
STANGELAND, CHARLES EMIL, 416 W. 118th Street, New York City.
STANTON, EDGAR WILLIAM, Prof., State Agricultural College, Ames, Iowa.
†STEIGER & Co., Newspaper Box 298, New York City. (4 copies.)
STEPHENS, HENRY MORSE, Prof., Univ. of Cal., Berkeley, California.
STERNS, WORTHY PUTNAM, 1723 G Street, Washington, D. C.
STEUART, WILLIAM M., The Kensington, Washington, D. C.
STEWART, JOHN LAMMEY, Lehigh Univ., South Bethlehem, Pa.
STINE, MATIUS, 34 E. 72d Street, New York City.
STOKES, ANSON PHELPS, 100 William Street, New York City.
STOKES, H. K., Mechanics' National Bank, Trenton, N. J.
STONE, ALFRED HOLT, 200 A Street, S. E., Washington, D. C.

Stone, Nahum I., 2006 Washington Avenue, New York City.
Straus, Isidor, 6th Avenue and 14th Street, New York City.
Straus, Oscar Solomon, 42 Warren Street, New York City.
Street, Robert G., Judge 56th Judicial District of Texas, Galveston, Tex.
Strong, Thomas N., Portland, Oregon.
Stubbs, William C., Audubon Park, New Orleans, La.
†Sumner, (Miss) Helen L., 1029 University Avenue, Madison, Wis.
†Swarthmore College, Swarthmore, Pa.
Swain, Henry H., Prof., Dillon, Mont.
*Swayne, Wager, 195 Broadway, New York City.
Takasu, Tasuke, Japanese Legation, Pekin, China.
Takemura, Kinji, care of Y. Ikeda, 27 Masagocho Hongo, Tokio, Japan.
†Tamaya, T. & Co., 5 Guiza Sanchome, Kyobashiku, Tokio, Japan.
Tanka, M. I., Librarian Imperial Library, Tokio, Japan.
Tarbell, (Miss) Ida M., *McClure's Magazine*, New York City.
Taussig, Frank William, Prof., Harvard Univ., 2 Scott Street, Cambridge, Mass.
Taylor, Fred Manville, Prof., Univ. of Mich., Ann Arbor, Mich.
Taylor, Graham, Prof., Christian Sociological Cong'l Sem., 43 Warren Avenue, Chicago, Ill.
Taylor, H. C., Prof., Univ. of Wis., Madison, Wis.
Taylor, William G. Langworthy, Prof., Univ. of Neb., Lincoln, Neb.
Tenney, D. K., 108 E. Main Street, Madison, Wis.
Tenney, M. A., 7147 Hermitage Street, Pittsburg, Pa.
†Texas, University, Austin, Texas.
Thach, Charles C., Pres. Ala. Polytechnic Inst., Auburn, Ala.
*Thom, DeCourcey Wright, 119 East Baltimore Street, Baltimore, Md.
Thompson, Charles N., Treas. George School, Bucks Co., Pa.
Thompson, Sandford Eleazer, Newton Highlands, Mass.
Thurber, Charles Herbert, 29 Beacon Street, Boston, Mass.
*Thurber, Francis B., 90 Broadway, New York City.
Thwaites, Reuben Gold, Secy., State Historical Society, Madison, Wis.
Tildsley, John L., 520 W. 123d Street, New York City.
Timlin, W. H., 105 Grand Avenue, Milwaukee, Wis.
Titsworth, Judson, 291 Ogden Avenue, Milwaukee, Wis.
Tooke, Charles Wesley, 606 University Avenue, Syracuse, N. Y.
†Toronto, University, Toronto, Canada.
Tucker, George Fox, 516 Barristers' Hall, Boston, Mass.
Tuckey, Edson Newton, Yale Univ., 23 Lynwood Street, New Haven, Conn.
†Tufts College, Tufts College, Mass.
†Tulane University Library, New Orleans, La.

TUTTLE, CHARLES AUGUSTUS, Prof., Wabash College, Crawfordsville, Ind.

†TWIETMEYER, A., Leipzig, Germany.

TWINING, A. C., Asbury Park, N. J.

TYSON, MALCOLM V., 216 N. Charles Street, Baltimore, Md.

UNDERHILL, C. M., Librarian, Utica Public Library, Utica, N. Y.

UPHAM, FREDERICK W., Pres. Board of Review, Old Colony Building, Chicago, Ill.

URDAHL, THOMAS K., 730 N. Weber Street, Colorado Springs, Col.

VAN VORHIS, FLAVIUS JOSEPHUS, 1129 Stevenson Building, Indianapolis, Ind.

VEASEY, JOHN H., Lomagundi Dist., Rhodesia, S. Africa.

VEBLEN, THORSTEIN B., Asst. Prof., Univ. of Chicago, Chicago, Ill.

VEDITZ, C. W. A., Bates College, Lewiston, Me.

VENABLE, RICHARD M., 205 E. German Street, Baltimore, Md.

†VERMONT, UNIVERSITY, Burlington, Vt.

VIETH, HENRY A., 234 11th Street, N. E., Washington, D. C.

VICKERS, E. H., 2 Nichome, Mita, Shiba, Tokio, Japan.

VINCENT, GEORGE EDGAR, Prof., Univ. of Chicago, 5737 Lexington Avenue, Chicago, Ill.

VIRTUE, G. O., Prof., 758 W. Broadway, Winona, Minn.

†WABASH COLLEGE, Crawfordsville, Ind.

WADLIN, HORACE G., Librarian Boston Public Library, Boston, Mass.

*WADSWORTH, H. L., Editor *Mining and Scientific Review*, Denver, Col.

°WAGNER, ADOLPH, Prof., Univ. of Berlin, Berlin, Germany.

WALKER, C. S., Mass. Agricultural College, Amherst, Mass.

WALKER, FRANCIS, Associate Prof., Adelbert College, 46 Nantucket Street, Cleveland, O.

WALKER, T. B., 803 Hennepin Avenue, Minneapolis, Minn.

WALLING, WILLIAM ENGLISH, 184 Eldridge Street, New York City.

°WALRAS, LEON, Prof., Univ. of Lausaune, Clarens, Vand, Switzerland.

*WALSH, CORRE, M., Bellport, L. I.

WARBURG, F. M., 27 Pine Street, New York City.

WARD, EDWARD G., Jr., Department of Agriculture, Washington, D. C.

WARD, JOHN H., 34 Kenyon Building, Louisville, Ky,

WARD, LESTER FRANK, 1464 R. I. Avenue, Washington, D. C.

WARNER, ADONIRAM JUDSON, Marietta, O.

WARREN, WILLIAM R., 81 Fulton Street, New York City.

†WASHINGTON, UNIVERSITY, Seattle, Wash.

WATERMAN, EDGAR F., 223 Asylum Street, Hartford, Conn.

WATKINS, GEORGE P., 215 Mitchell Street, Ithaca, N. Y.

WEATHERLY, ULYSSES GRANT, Prof., Indiana Univ., Bloomington, Ind.

WEAVER, E. E., Harrodsburg, Ky.
WEAVER, JAMES RILEY, Prof., DePauw Univ., Greencastle, Ind.
WEBER, ADNA F., Chief Statistician, New York State Department of Labor, 302 Washington Avenue, Albany, N. Y.
WEBER, GUSTAVUS A., Bureau of Labor, Washington, D. C.
WEEKS, RUFUS W., 346 Broadway, New York City.
WELLES, F. R., 44 Rue St. Didier, Paris, France.
WELLS, DAVID COLLIN, Prof., Dartmouth College, Hanover, N. H.
WELLS, PHILIP P., 72 Mansfield Street, New Haven, Conn.
WEST, MAX, Treasury Department, San Juan, Porto Rico.
WEST, WILLIAM L., 330 West 3rd Street, St. Paul, Minn.
WESTENHAVER, D. C., 929 Garfield Building, Cleveland, O,
†WESTFIELD ATHENAEUM, Westfield, Mass.
WESTON, CHARLES, 1220 L. Street, Lincoln, Neb.
WESTON, NATHAN AUSTEN, Asst. Prof., Univ. of Ill., Champaign, Ill.
†WEST VIRGINIA UNIVERSITY, Morgantown, W. Va.
*WETMORE, GEORGE PEABODY, Newport, R. I.
WEYL, WALTER E., 1611 N. 15th Street, Philadelphia, Pa.
WHEELER, FRED B., Genl. Mgr. Binghamton Gas Works, 30 Chenango Street, Binghamton, N. Y.
WHITAKER, ALBERT C., Stanford Univ., Palo Alto, Cal.
WHITE, ANDREW DICKSON, Former U. S. Minister to Germany Ithaca, N. Y.
WHITE, FRANK, Gov. of N. D., Bismarck, N. D.
WHITE, HERBERT H., Hartford, Conn.
WHITE, HORACE, 18 W. 69th Street, New York City.
*WHITE, JULIAN LEROY, 51 *News* Building, Baltimore, Md.
WHITE, (Miss) MARGARET, 11 Highland Street, Cambridge, Mass.
WHITE, PETER, Marquette, Mich.
WHITNEY, EDSON LEONE, 1118 K Street, N. E., Washington, D. C.
WHITTLESEY, (Miss) SARAH SCOVILL, 367 Prospect Street, New Haven, Conn.
WHITTEN, ROBERT HARVEY, State Library, Albany, N. Y.
WICKER, GEORGE RAY, Dartmouth College, 30 N. Main Street, Hanover, N. H.
WILCOX, DELOS FRANKLIN, Author, Elk Rapids, Mich.
WILGUS, JAMES ALVA, Platteville, Wis.
WILLARD, NORMAN P., 1532 Marquette Building, Chicago, Ill.
WILLCOX, WALTER FRANCIS, Prof., Cornell Univ., Ithaca, N.Y.
WILLETT, ALLAN H., Brown Univ., Providence, R. I.
†WILLIAMS COLLEGE, Williamstown, Mass.
WILLIAMS, G. C. F., Hartford, Conn.
WILLIAMS, HARVEY LADEW, Box 410, Bristol, Tenn.
WILLIAMS, TALCOTT, 916 Pine Street, Philadelphia, Pa.
*WILLIAMS, TIMOTHY SHALER, 913 Union Street, Brooklyn, N. Y,
WILLIS, HENRY PARKER, Prof., Washington and Lee Univ., Lexington, W. Va.

WILLOUGHBY, WILLIAM FRANKLIN, U. S. Department of Labor, Washington, D. C.
WILLOUGHBY, W. W., Johns Hopkins Univ., Baltimore, Md.
WILSON, GEORGE GRAFTON, Prof., Brown Univ., Providence, R. I.
WILSON, THOMAS, The Aberdeen, St. Paul, Minn.
WILSON, WOODROW, Pres., Princeton Univ., Princeton, N. J.
*WINSLOW, WILLIAM COPLEY, 525 Beacon Street, Boston, Mass.
WINSTON, AMBROSE PARÉ, Washington Univ., St. Louis, Mo.
WOOD, FREDERICK A., 295 Pawtucket Street, Lowell, Mass.
WOOD, STUART, 400 Chestnut Street, Philadelphia, Pa.
*WOODFORD, ARTHUR BURNHAM, Prof., "Oak Hill," 469 Whalley Avenue, New Haven, Conn.
WOODRUFF, CLINTON ROGERS, 818–819 Girard Building, Philadelphia, Pa.
WOODWARD, P. H., Conn. Gen. Life Ins. Co., Hartford, Conn.
WOOLWORTH, JAMES MILLS, Omaha, Neb.
†WORCESTER FREE PUBLIC LIBRARY, Worcester, Mass.
*WORTHINGTON, T. K., *The Daily News*, Baltimore, Md.
WRIGHT, CARROLL DAVIDSON, United States Commissioner of Labor, Washington, D. C.
WYCKOFF, WALTER AUGUSTUS, Prof., Princeton Univ., Princeton, N. J.
†WYOMING, UNIVERSITY, Laramie, Wyom.
YARROS, VICTOR S., 608 E. Division St., Lincoln Park Station, Chicago, Ill.
†Y. M. C. A. LIBRARY, 317 W. 56th Street, New York City.
YOUNG, ALLYN A., Asst. Prof., Adelbert College, Cleveland, O.
YOUNG, FREDERICK G., Prof., Eugene, Oregon.
YOUNG, JOHN P., *Chronicle* Office, San Francisco, Cal.
ZACHRY, JAMES G., 1038 Fifth Avenue, New York City.

SUMMARY OF MEMBERSHIP—FEBRUARY 1, 1904.

Honorary members	13
Life members	75
Annual members	751
Subscribers	148
Total	987

GEOGRAPHICAL DISTRIBUTION OF MEMBERS AND SUBSCRIBERS.

Alabama	3	Michigan	26	Vermont	6
Arizona	1	Minnesota	18	Virginia	2
Arkansas	1	Mississippi	1	Washington	11
California	29	Missouri	26	West Virginia	5
Colorado	6	Montana	4	Wisconsin	32
Connecticut	33	Nebraska	14	Wyoming	2
Dist. of Columbia	57	New Hampshire	5	Philippine Islands	1
Florida	1	New Jersey	20	Porto Rico	1
Georgia	1	New York	205		
Idaho	1	North Carolina	7	Japan	14
Illinois	61	North Dakota	2	Great Britain and Ireland	13
Indiana	16	Ohio	45	Canada	10
Iowa	15	Oklahoma	2	France	6
Kansas	4	Oregon	6	Germany	6
Kentucky	6	Pennsylvania	63	Other foreign countries	15
Louisiana	9	Rhode Island	12		
Maine	7	South Dakota	3		
Maryland	31	Tennessee	5	Total	987
Massachusetts	109	Texas	8		

SUMMARY.

	1901	*1902*	*1903*	*1904*
North Atlantic States	357	434	463	460
South Atlantic States	79	107	109	104
North Central States	233	279	289	262
South Central States	18	23	23	35
Western States	55	63	62	60
Foreign	60	61	62	66
Total	802	965	1008	987

THE SIXTEENTH ANNUAL MEETING

The Sixteenth Annual Meeting of the American Economic Association was held at New Orleans, La., December 29 to 31, 1903. The American Historical Association met at the same time and place, and two joint sessions of the two Associations were held. A special train starting from New York brought 105 persons, a large party came in special cars from Chicago, and several smaller parties came from the South and West.

The program as carried out was as follows:

PROGRAM

First Session—Tuesday, December 29, 10 A. M.

Division A, Court Room, Civil District Court, Jackson Square.

SOUTHERN AGRICULTURAL PROBLEMS.

1. Tobacco. LAWSON H. SHELFER, of Nacogdoches, Tex., Tobacco Expert of the United States Department of Agriculture.
2. Discussion by J. B. KILLEBREW, Expert on Tobacco for the Census of 1880, Nashville, Tenn.
3. Sugar. WILLIAM C. STUBBS, of Baton Rouge, La., Director of the Louisiana Sugar Experiment Stations.
4. Discussion by JOHN DYMOND of Belair, La.
5. Rice. S. A. KNAPP, of Lake Charles, La., President of the Rice Association of America.
6. Discussion by S. LOCKE BREAUX, of New Orleans, Vice-President of the Rice Association of America.
7. Cotton and the General Agricultural Outlook. D. F. HOUSTON, President of the Agricultural and Mechanical College of Texas, College Station, Texas.
8. Discussion by GEORGE K. HOLMES, Department of Agriculture, Washington, D. C.

Tuesday, 1 P. M., Creole luncheon given to members by the Louisiana Historical Society, at the Cabildo, Jackson Square.

Second Session—Tuesday, December 29, 2.30 P. M.

Louisiana Supreme Court Room, Cabildo, Jackson Square.

INDUSTRIAL PROBLEMS OF THE SOUTH.

1. The Cotton Industry. D. A. TOMPKINS, of Charlotte, N. C.
2. Discussion by CHARLES C. THACH, President of the Alabama Polytechnic Institute, Auburn, Ala.
3. The Utilization of Southern Wastes. RICHARD H. EDMONDS, Editor of the *Manufacturers' Record*, Baltimore, Md.
4. Discussion by STUART WOOD, of Philadelphia.

Third Session—Tuesday, December 29, 8 P. M.

Newcomb College, Washington Avenue, corner Chestnut Street.

JOINT SESSION WITH THE AMERICAN HISTORICAL ASSOCIATION.

1. Address of Welcome, by EDWIN A. ALDERMAN, President of Tulane University.
2. Social Aspects of Economic Law. Address, by EDWIN R. A. SELIGMAN, Columbia University, President of the American Economic Association.
3. Ethical Values in History. Address by HENRY C. LEA, President of the American Historical Association.

Fourth Session—Wednesday, December 30, 10 A. M.

Tulane University Library.

ECONOMIC THEORY.

1. The Relations between Rent and Interest. FRANK A. FETTER, Cornell University. (The opening paper read by title only.)
2. Discussion by THOMAS N. CARVER, Harvard University; J. H. HOLLANDER, Johns Hopkins University; CHARLES W. MCFARLANE, Philadelphia, Pa.; LINDLEY M. KEASBEY, Bryn Mawr College; WILLIAM G. LANGWORTHY TAYLOR, University of Nebraska; ALBERT C. WHITAKER, Leland Stanford Junior University.

1 P. M., at Tulane University, luncheon given by friends of the Association in New Orleans. 4 P. M. meeting of the Council, and of those interested in the projected Political Science Association. Reception at the home of Mrs. T. G. Richardson, 4 to 6 P. M.

Fifth Session—Wednesday, December 30, 8 P. M.

Banquet Hall of New St. Charles Hotel.

CORPORATE AND PUBLIC FINANCE.

1. The Management of the Surplus Reserve. EDWARD S. MEADE, University of Pennsylvania.

2. Discussion by JOHN H. GRAY, Northwestern University; HENRY R. HATFIELD, Chicago University.
3. The Theory of Loan Credit in Relation to Corporation Economics. J. PEASE NORTON, Yale University.
4. Discussion by FREDERICK A. CLEVELAND, New York University.
5. State Taxation of Interstate Commerce. F. J. GOODNOW, Columbia University.
6. Discussion by WINTHROP M. DANIELS, Princeton University; CARL C. PLEHN, University of California.

After the session, smoker at the Round Table Club.

Sixth Session—Thursday, December 31, 10 A. M.

Tulane University Library.

THE TRUST PROBLEM.

1. Trusts. HENRY C. ADAMS, University of Michigan.
2. Discussion by HENRY C. EMERY, Yale University; BALTHASAR H. MEYER, University of Wisconsin; JAMES E. LEROSSIGNOL, University of Denver; EDWARD W. BEMIS, of Cleveland, O.; MAURICE H. ROBINSON, University of Illinois; summary of discussion by HENRY W. FARNAM, Yale University.

2 P. M., a walk in the Vieux Carré.

Seventh Session—Thursday, December 31, 8 P. M.

Gibson Hall, Tulane University.

SECOND JOINT SESSION WITH THE AMERICAN HISTORICAL ASSOCIATION.

1. A Theory of Social Causation. FRANKLIN H. GIDDINGS, Columbia University.
2. Discussion by ALBION W. SMALL, Chicago University; CHARLES H. COOLEY, University of Michigan; LESTER F. WARD, Smithsonian Institution; of the American Economic Association; and E. EMERTON, Harvard University; GEORGE L. BURR, Cornell University; WILLIS M. WEST, University of Minnesota; of the American Historical Association.

9.30 P. M., reception at Tulane University, by President Alderman and the Faculty of Tulane University.

Friday, Jan. 1, 9.30 A. M. Excursion on the Mississippi, with stops at Chalmette, near the battle-field of New Orleans, and at a sugar plantation.

COUNCIL MEETING

The Council met Wednesday, December 30th, 1903, at 2:45 P. M., in the Library of Tulane University, President Seligman being in the chair. The Secretary's report was read and accepted. It is as follows:

REPORT OF THE SECRETARY TO THE COUNCIL OF THE AMERICAN ECONOMIC ASSOCIATION.

DECEMBER, 1903.

Three meetings of the Executive Committee have been held during the current year. At the first, held at the close of the last annual meeting, a preliminary discussion was given to the various subjects referred to the committee, and the Treasurer was authorized to place the surplus of the Association where it would draw interest. Acting on this authority, the Treasurer arranged with the bank whereby interest at 3½% has been paid on $1,500 during the current year.

At the meetings held on the call of the President, April 25th and November 27th in New York City, were considered the various subjects that had been referred to the Executive Committee. At the spring meeting a conference was held with representatives of the committee having in charge the subject of a new Political Science Association or of some means of fuller consideration of questions of political science in the meetings of the Economic and Historical Associations. As a result of this discussion, a time has been set aside at this meeting for the consideration of this subject.

The question of publication policy was debated at length at both meetings. It was agreed that a merely

popular publication was not practicable, and that a popular magazine was not desirable. A number of possible amendments of the present publication program were submitted by the members of the committee and some of them will be suggested to the Council as worthy of consideration. The Secretary was instructed to ask the existing Journals whether they would make a special club rate to the members of this Association.

The coöperation of this Association with the Carnegie Institute was furthered by the action of a sub committee and particularly by the efforts of President Seligman. The members of the Council received inquiries regarding their choice of committee heads for the work in economic history of the United States contemplated by the Carnegie Institute. On the basis of this vote, the results of which were compiled, recommendations were made to the committee of the Carnegie Institute which were substantially adopted.

The following recommendations are made by the Executive Committee to the Council:

(1) That to provide for work in bibliography and economic legislation the Council appropriate not to exceed $500 a year to be put at the disposal of the Publication Committee;

(2) That the Publication Committee be authorized in its discretion to publish as separate numbers any portions of the annual proceedings;

(3) That the Association issue annually a list of doctors' theses in process of writing in American Universities;

(4) That the ex-Presidents of the Association be continued as life members of the Executive Committee, provided that they be not counted in the number necessary to a quorum;

(5) That the plan be continued that has been followed in the past two years of having the Executive Committee act as a committee on time and place of meeting in consultation with a similar committee of the American Historical Association, reporting its recommendations a year in advance to the Council at the regular annual meeting.

A sub-committee was appointed to confer with a committee of the American Historical Association with reference to the next meeting place, and that committee's report will be presented at this meeting.

The standing committees on the Economic Condition of the Negro, and on Index Numbers have reported progress, but neither was prepared to submit a formal report through the Secretary at this time. Doubtless they will have something to present to the Council.

During the present year 6 members of the Association died, 1 being a life member; 47 resigned; 8 were dropped for non-payment of dues; the total loss of members was 61, and of subscribers was 4. Since the last report there have been added 36 members (one of them being a life member) and 8 subscribers. The net loss of members is 21; net gain of subscribers is 4; the total net loss being 17. At the date of this report there are 994 members, a few less than a year ago. This number doubtless can be increased by another effort such as has been made in the past. Certainly the influence of, and the interest in, the Association has suffered no decline in the past year.

The publications have been issued with greater regularity than for several years past. The fourth number was delayed in a number of unavoidable ways as it went through the press, but is now being mailed to the members. The Publication Committee has furnished the

manuscript promptly and deserves the gratitude of the Secretary and the congratulations of the Association for its exceptional record. The total number of pages published this year is 986, several hundred fewer than in preceding years. There is reason to think that the Association's usefulness will be fully as great if it limits its publication in bulk and concentrates its efforts on increasing the quality and usefulness of its output.

The Treasurer's account shows a balance of $3,040.10 which is an increase of eight hundred dollars over that of any previous report, although five printing bills have been paid during the current year.

Very respectfully submitted,

FRANK A. FETTER.

TREASURER'S REPORT.

FRANK A. FETTER, Treas.

In account with the American Economic Association for the year ending December 24, 1903.

Debits.

Cash on hand at date of last report			$2,188 92
Sales and subscriptions—			
The Macmillan Co.	$837 93		
Secretary's office	349 32		
Swan Sonnenschein	40 38	$1,227 63	
Reprints		52 70	
Life member		50 00	
Annual dues		1,979 20	
Interest		26 25	

Credits.

Expense of publications			$1,803 76
Expense of President's office			212 86
Expense of Sec. and Treas. office			307 70
Expense of meetings—			
Fifteenth Annual Meeting	$85 28		
Sixteenth Annual Meeting (part)	75 00		160 28
Balance in cash			3,040 10
		$5,524 70	$5,524 70

The President appointed as a committee to audit the report of the Treasurer, Messrs. B. H. Meyer and Jesse E. Pope.

J. H. Hollander reported in behalf of the committee on time and place in favor of a meeting in Chicago in December, 1904, with the expectation that the meeting might be held in Washington and Baltimore in 1905. By invitation of the Council, Albion W. Small addressed the body with reference to the meeting in Chicago. On motion of Stuart Wood the report of the committee was accepted.

The President read a letter from Carroll D. Wright, a trustee of the Carnegie Institute, in reference to the contemplated work in economic history. The Secretary was instructed to forward to the Carnegie Institute the following resolution: "*Resolved*, That the Council of the American Economic Association desires to express its cordial recognition of the liberal action of the Carnegie Institute in providing for research in American economic history, and tenders its hearty coöperation in the same as opportunity may arise." It was moved and carried that paragraph 2 of article 6 of the constitution be amended so as to include the former Presidents of the Association as life members of the Executive Committee, provided that a quorum shall consist of four out of the seven elected officers.

It was voted to continue the plan of having the Executive Committee act as a committee on time and place of meeting in consultation with a similar committee of the American Historical Association, reporting its recommendations a year in advance to the Council at the regular annual meeting.

It was voted that to provide for work in bibliography

and economic legislation the Council appropriate not to exceed $500 a year to be put at the disposal of the Publication Committee. That committee, however, before taking action, is to secure the approval of the Executive Committee.

It was voted that the Publication Committee be authorized in its discretion to publish as separate numbers any portions of the annual proceedings.

It was voted that the chairman of the Publication Committee make a report at the next annual meeting outlining a plan of future publication activity.

It was voted that the resolution that the Association issue annually a list of doctors' theses in process of writing in American Universities be referred to the Executive Committee with power to act.

The report of the Nominating Committee, made by its chairman, Richard T. Ely, was as follows: President, Frank W. Taussig; Vice-Presidents, Irving Fisher, John W. Gray and John Graham Brooks; Secretary and Treasurer, Frank A. Fetter. Elected members of the Executive Committee, W. M. Daniels, Henry B. Gardner and W. Z. Ripley. Members of the Publication Committee, David Kinley, Henry R. Seager. By unanimous vote the Secretary was authorized to cast a single ballot for the names recommended by the committee.

The members of the Council whose terms expire in 1904 were renominated, but as the committee was not prepared to report nominations for new members of the Council, it was authorized to report later to the Executive Committee. In accordance with this authority the following new names were added to the Council: Walter E. Clark, Frederick A. Cleveland, Katharine A.

Coman, George M. Fisk, Henry R. Hatfield, James E. LeRossignol, Albion W. Small, E. N. Tuckey, Albert C. Whitaker.

It was moved by L. M. Keasby, on behalf of the Nominating Committee, that the Secretary be provided with an assistant with a salary to be fixed by the Executive Committee. Carried.

A letter was read from the Census Bureau asking the coöperation of the Economic Association, especially on the question of financial statistics.

It was voted that the chair appoint a committee of ten or more on municipal accounting and finance, and by amendment the chair (Mr. Seligman) was made a member of the committee.

In pursuance of this resolution the committee was constituted as follows: F. A. Cleveland, chairman; F. R. Clow, W. M. Daniels, F. A. Fetter, H. B. Gardner, F. J. Goodnow, C. C. Plehn, E. R. A. Seligman, R. H. Whitten.

A committee on resolutions was appointed by the chair. The Council then adjourned.

RESOLUTION

At the last joint session of the two Associations, on the motion of Stuart Wood, the following was unanimously adopted:

Resolved, That the American Historical Association and the American Economic Association tender to their friends in New Orleans most heartfelt thanks for the many graceful and kindly courtesies during the period

of the meeting in this city—a meeting which will always have an especial place in the memory of the visitors as a time of peculiar pleasure and interest.

And in particular they desire to express their appreciation of the generous attentions and entertainment extended to them by Tulane University and by its President and Faculty, and by Newcomb College, the Civil District Court, the Louisiana Historical Society, the Round Table Club, by Mrs. T. G. Richardson, Mrs. William Preston Johnson, Messrs. W. G. Wilmot & Co., Mr. T. P. Thompson, and Professors Ficklen, Aldrich and Fortier, of Tulane University.

PAPERS AND DISCUSSIONS

SOCIAL ASPECTS OF ECONOMIC LAW

PRESIDENTIAL ADDRESS BY EDWIN R. A. SELIGMAN

In the address which I had the honor to deliver on this presidential platform last year, attention was directed to the relation between economics and social progress. The effort was made more particularly to estimate the weight to be attached to the influence of economic forces upon social life, and to the effect of economic doctrines on social speculation. This year we shall, with your leave, look at the reverse of the shield, and endeavor to study some of the social aspects of economic facts and theories. In lieu of centering our gaze upon the narrow, although stable, economic foundation of social thought and social institutions, let us direct our view to the broad, but deep, social basis of economic principle and economic fact. Last year we studied some of the economic aspects of social law; this year we shall study some of the social aspects of economic law.

Such a course seems to require some justification. Why weary us with an old story, it will be said? Why reiterate a thrice told tale? Do we not know that the economic life is a part of the wider social life? Are we not fully aware of the fact that economics is a social science, and that every economic theory is in large part social in character? Do we not realize, quite adequately, the social imprint upon every economic fact?

In reply to such objections, I have to answer this:

We grasp the form, but not the substance. We think that we appreciate the social basis of economic law, but in reality our appreciation is fragmentary. We do the theory lip-service, but not brain-homage. We are oblivious of its real significance. Because of this, in some of the basic questions of economic theory there are discord and confusion, where there should be harmony. Because of this, in some of the most important questions of applied economics, we are floundering about, tossed on the stormy sea of doubt without rudder or compass. Because of this, some of the current and seemingly fundamental doctrines of public finance are in reality erroneous, or at least impotent to explain modern tendencies or to afford any satisfactory clue to the solution of modern difficulties. By their fruits shall ye know them!

This is a severe and comprehensive indictment. You will accordingly expect me to substantiate these charges, at least so far as it is possible to do so within the limits of a single address.

The contrast between the social and the individual point of view has recently been made familiar to us in allied domains. Take, for instance, the whole range of ethical inquiry. Without entering at all upon the deeper problems of transcendental origins and supramundane sanctions, and limiting ourselves to a consideration of human development, it is now substantially conceded, or at least coming more and more to be recognized, that private ethics is an outgrowth of social ethics, that the morality of the individual has been fashioned by the morality of the social group, and that the very conception of right and wrong, so far as it is of human origin at all, is the product of social, not of individual, forces. The weakness of the early utilitarian

theory is to be sought not in the fact that it propounded a hedonistic explanation of morality, but in that it placed itself upon the narrow ground of individual utility rather than upon the broad foundation of social utility.

Our concern, however, is with economic, rather than with ethical, forces; and in the economic field we have ample and palpable proof of the short comings of the individual point of view, in history and in theory alike.

Take, for instance, Adam Smith's account of the essential principle of economic progress. You remember that Adam Smith finds the explanation in the division of labor, and thinks that this is the result of a certain trait in human nature, "the propensity to truck, barter, and exchange one thing for another." This individual propensity is made by Adam Smith the corner stone of his entire edifice of economics. Yet modern research in ethnology has disclosed the undoubted fact that he is quite mistaken. Far from there having been a natural propensity in man to truck and barter, the original propensity was just the reverse. Exchange was at the outset, and for many long centuries, considered not natural, but unnatural; not normal, but abnormal; not economic, but uneconomic; not useful, but reprehensible.

An analysis of the very terms used by Adam Smith shows this clearly enough. To truck is etymologically to trick, to cheat; barter is another form of barrator, and although barratry persists to-day only as a particular kind of crime, its primary meaning was far broader. Exchange was therefore originally deemed a bad thing, a heinous offence, as involving a wrong to the other party.

But, furthermore, we now know with some degree of verisimilitude how barter arose, and how it slowly

changed from a wasteful to an economic process. Recent investigation has disclosed to us the phenomenon of the silent trade, and has made it clear that the earliest forms of exchange were inter-tribal, and not intra-tribal. It was only after the early hordes or clans had worked out the system of joint and collective presents and counterpresents which form the basis of primitive group barter, that the individual members of the clan came to recognize the applicability of a similar system within the group. Private barter is the result of communal barter, individual trade is an outgrowth of social trade. The propensity to truck, far from being a natural and original inclination of the individual, as Adam Smith thought, is a direct product of social forces. It is not antecedent, but consequent.

What is true historically is true analytically. If economics is a science at all, it is a science of values—not of all values indeed, but of economic values. Yet some of the basic discussions of economic theory are still beclouded by the inability to distinguish the social character of value. The favorite study of Robinson Crusoe, who figures so prominently in the older treatises, is indeed still useful as affording an illustration of the psychology underlying all individual choices; but the attempt to apply these conclusions directly to modern economic problems is fraught with peril, because the economic life of to-day rests not on Robinson Crusoe conditions, but on social conditions. I have elsewhere called attention to the fact that the contest still raging between the partisans of the cost theory and of the utility theory of value is at bottom based on a misconception, and with your permission I shall spend just a moment in recalling this rather technical point to your minds.

When we say, correctly enough, that value[1] is the expression of utility, we really mean that it is the expression of social marginal utility. While social utility indeed is made up of a combination of individual utilities —that is, while a thing cannot be useful to society unless it is useful to the individuals who compose the social group, the marginal utility that controls value is the reflection of the social marginal utility. Even though a pound of iron may at a given moment conceivably be of more direct use to an individual than a pound of diamonds, a pound of iron does not satisfy as many, or as urgent, social wants as a pound of diamonds. Iron is less valuable than diamonds because its social marginal utility is less. In the same way, when we say that value depends on cost, we refer really to social, not to individual, cost. The street sweeper may work harder than an opera singer, yet the value of his services will be less. It may cost me five days to make a table that the factory will turn out in five hours, yet my table will not sell for more. The marginal cost around which values gravitate is not individual cost, but social cost. The value of a commodity is due not to the labor of the individual who has made it, but to the social service which it is going to render, that is, to the social sacrifice which it is going to save. When we say that individual cost of production fixes value, we really mean that it expresses the value that is fixed by social forces as a whole.

The failure to recognize the essential equivalence of marginal utility and marginal cost is due to the neglect of this social element. It is true indeed that in modern life there is no such equivalence for the individual considered as such ; and this has led most thinkers astray. If a knife ordinarily exchanges for a book, to any one

[1] "The Social Elements in Value," *Quarterly Journal of Economics*, vol. XV, 1901.

individual the pleasure may still be less than the sacrifice, and to his neighbor the sacrifice may be less than the pleasure. I may like a cow more than a horse, or I may be able to raise a particular horse for less than a particular cow; but that will not enable me to buy horses in the market for less than cows. The balance or equilibrium is not between the pain and the pleasure of the individual, but between the pain and the pleasure of the group. Individual utility is indeed not equal to individual cost; but social marginal utility must everywhere be equivalent to social marginal cost. The idea that there is an inevitable opposition between the cost theory and the utility theory of value rests on the failure to discern its social basis.

Let us look at some of the consequences of this failure. The classical economists thought that they had hit upon an important truth in differentiating the theory of international trade from that of domestic trade. As finally developed by Cairnes, the theory of international trade rests on an acute analysis of reciprocal demand and reciprocal cost in the sense of comparative social sacrifice. But Cairnes, like Ricardo and Mill before him, did not see that the same analysis is applicable to all trade, that is to all value, because in internal, as well as in international, commerce the controlling considerations are social, and not individual in character. It must therefore not surprise us to find that only the other day the gifted Prime Minister of England issued a noteworthy pronunciamento on the tariff agitation, in which he employed as one of the fundamental premises of the argument for protection, or rather for retaliation, precisely this unreal distinction between the theory of international and the theory of internal trade.[1] When we reflect on the weight

[1] *Economic Notes on Insular Free Trade.* By the Rt. Hon. Arthur James Balfour. 1903. p. 5.

to be attached to this ministerial manifesto in the politics of a great nation, must we not recognize the important consequences of such an error in theory.

I do not wish to be understood as intimating that because one of the premises happens to be unfortunately chosen, the conclusion cannot be defended on other grounds. On the contrary, the relation between the individual and the social elements of economics has often been inadequately expounded by the free traders, no less than by the protectionists. Adam Smith himself seems to realize that the collective interests are paramount, when he seeks to unfold the principles of the Wealth of Nations, but he identifies the social with the individual interests when subject to the unimpeded action of natural law. The Mercantilists of old based their demands for extreme protection on the mistaken theory of balance of trade—mistaken, because it confused the collective economy with the private economy—because it assumed that a country, like an individual, must have a surplus money income. But the Free Traders went to an opposite extreme when they identified the social with the individual interest and claimed that if only individual action be unfettered and if free scope be given to the principle of self-interest the results are bound to be beneficent for the group as well.

Another illustration of the tangle of thought into which we are plunged by the failure to realize the social implication of economic law is to be found in the theory of private property. We have been taught that our modern age is immeasurably superior to that of classic antiquity, and as a typical proof we are referred to the progress in the theory of property. The Roman doctrine of private property was that of occupation, and is no doubt to be explained in large measure by the facts

in the development of Roman life. On the other hand, the theory as elaborated by the philosophers, and tacitly accepted by the people, of recent centuries is the labor theory. We pride ourselves on the advance that has been made. The Romans seized their property, so it is said; we earn our property: the one is a brutal doctrine; the other a moral doctrine.

And yet, half uneasily, half regretfully, we are beginning to realize that things are not quite so simple; that the labor theory does not exactly fit into the facts of modern life. In truth, the labor theory, like the occupation theory, is deficient because it looks at the individual, instead of the social, element. Take for example our modern problem of irrigation. The English common law conception of private property—the property that reaches, as has been drastically said, from heaven to hell—is a product of a moist climate—of conditions where there is an abundance—nay, even a superabundance—of water, and where private interest could be safely depended upon to give the best results. But in the arid and semi-arid regions of our western empire, neither occupation nor labor is deemed to give an equitable title to the river or the adjacent riparian lands. The new code of private property which is springing up in the West is one in which the individual rights are clearly and forcibly held subservient to those of the community.

What is true of irrigable land in the West is true in varying degree of many forms of private property in the East. "May I not do as it listeth me with my own," is a cry far less frequently heard than of old. Private property as a concept will no doubt always remain with us; but the content of the concept is changing and has changed from the beginning of civilization. Property

in slaves was at one time considered economically advantageous and morally defensible. Private ownership of the highways was not so long ago usual and justifiable. In the city of New York to-day the process of the extinction of private property in docks is fast going on. If, as Carlyle tells us, no one believes what his grandfather believed, we may almost say no man owns what his grandfather has owned. Moreover, not only do we no longer own the same things, but even where this is the case, we do not own them in precisely the same way. What phrases are more common to-day than the obligation of wealth—the public trusteeship of property, and the like. How long will it be before we tread the same path that has been opened up in the fiscal domain, where voluntary contributions have become transmuted into compulsory payments, and where the moral duty is now converted into a legal obligation. With the advance of society the individual element in the justification and in the content of private property recedes, and the social element comes to the fore.

Another application of the same principle may be seen in the controversy that is agitating all parts of our country to-day—the labor question, with the problem of trade-unionism and the open shop. If there were time, it would be profitable to dwell upon this thought—that while there is indeed only too much truth in the contention that many of our unions are steering perilously close to the rocks of monopoly and extortion, the problem cannot be solved simply by emphasizing the right of the individual laborer. The right of the individual to work is indeed, as Turgot told us over a century ago, a sacred and imprescriptible right; but the conditions under which this right is to be exercised are by no means a matter of mere individual discretion and of social unconcern. We

are beginning to see that the securest guarantee of liberty is the social sanction—that true and permanent freedom is at bottom an outgrowth of social forces, and that individual bargaining results in a mere empty husk of freedom. Liberty—to quote Carlyle again—is a divine thing; the liberty to die by starvation is not so divine. If this is true, then the real sacredness and imprescriptibility attach to that wise and collective action which will secure a higher and more effective liberty for the members of the group, and which it goes without saying must be so devised as not to close the door of opportunity to either the unfortunate or the peculiarly gifted. To magnify the individual at the expense of the social group is to close our eyes to the real forces that have elaborated modern liberty and modern democracy, not in the backwoods of a frontier community but in the busy marts of commerce and the complex home of industry.

But however tempting the pursuit of this line of inquiry would be, I must pass it by in order to reach what is in some respects a still more important illustration. This is to be found in the domain of public finance. Partly for this reason, and partly because the questions of public finance have never been touched upon by any of my predecessors in their presidential addresses, I venture to deal with this part of the subject at greater length.

The point I have in mind is concerned with a fundamental problem in taxation. In the ordinary manuals we find the chief emphasis put on the principles of uniformity and universality of taxation. The study of distributive justice, in its economic foundations, has long been the storm center of scientific fiscal controversy. Whether with the older writers we advocate the doctrine

that men should be called upon to discharge their obligations to government in accordance with the benefit they receive from it—or whether with the newer writers we accept the doctrine that taxes should be levied in proportion to the ability of the tax-payer—in both cases alike the starting point and the goal of the discussion is the individual. This of course does not mean that these doctrines equally rest upon what might be called the atomic doctrine of the state. On the contrary, it is a matter of common knowledge that while the benefit theorists accept that conception of government which has been described as "anarchy plus the policeman" the faculty theorists on the contrary count in their ranks the advocates of radical social reform and even most of the socialists themselves.

The point that it is desired to emphasize, however, is that both schools are individualistic in the sense that their conception of justice in taxation revolves about the burden resting on the original individual who pays the taxes, and disregards the subtler consequences of the economic law that governs the transaction. Just as the benefit theorists think only of the advantages accruing to the individual, so the faculty theorists are primarily concerned with the problem of equal sacrifice as between individuals, with the exemption of the individual minimum of subsistence, and with the scheme of graduated taxation as between individuals. They, like the others, have in mind first and foremost the individual.

Now, there are two remarkable facts connected with this modern development of fiscal theory. In the first place, every American investigator cannot but be struck with the discrepancy in our text books between the theories and the application of the theories. My distinguished predecessor in this presidential chair, Professor

Henry C. Adams, will I trust not think that any betrayal of confidence is involved when I recall his statement that the great difficulty with which he had to contend, when writing his admirable work on the Science of Finance, was the well-nigh insuperable task of making his conclusions, drawn from the theory of ability, of any practical avail when dealing with our specific problems. And if we could analyze the thought of many members of this audience, I am confident that my distinguished predecessor is not by any means the only one who has been forcibly struck by this fact. The theoretical conclusions all seem to point one way, and the possibility of practical application the other. In fact, if I may be pardoned for sounding a personal note, it was this yawning gulf, this gaping hiatus between theory and application which prevented me from publishing several years ago the results of a protracted study on the Income Tax. I did not then understand that the difficulty is far more deep-rooted, and that the disparity is due not to any doctrine of faculty, but to the underlying individual basis of the accepted theory of finance.

Not only are the conclusions of the generally received doctrine inapplicable to our condition, but—and here we come to the second remarkable fact—the recent history of American taxation seems to be in flat contradiction to the very foundations of the theory. Equality and universality of taxation are accepted as the corner-stones of the faculty theory. How then shall we explain the indubitable fact that our general property tax is disappearing, that personalty is slipping out of the assessment lists, and that in all our great industrial centers at least, real estate has come to bear well nigh the exclusive burden. Where are the equality and the universality of that practice? How shall we explain the fact that while

indirect taxation is theoretically opposed to the doctrine of equality, in the country as a whole the revenue from indirect taxation is a continually increasing proportion of the total income. And if it is claimed that at all events our modern taxation of corporations is a step in the direction of greater equality, do you not see that the real tax-payers are not these fictitious entities which are called corporations, but the human beings that compose them? Taxation of the corporation is not taxation of the individual security holder, for the majority of the securities in great classes of our corporations are in the hands of the bond-holders who are not touched by the tax; since in every solvent corporation the payment of the stipulated interest is deemed a fixed charge, taking precedence of the payment of taxes. Wherever we turn the facts seem to give the lie to the doctrine of ability.

What is the explanation of this curious state of affairs? Are we really going to the bad? Have we lost our grip on the cardinal principles of justice? Or is the fault to be ascribed to the theory rather than to the facts. And if so, where shall we look for its weakness, and what is the new doctrine that is capable of interpreting the facts, and of clearing up the mist in which the whole subject is enshrouded.

To these queries I would answer: our American development is based not on injustice, but on justice; it is moving in the right, not in the wrong direction; it is in accord with, not in opposition to, the real economic law. If the current theory does not harmonize with the facts, so much the worse for the theory. In truth we have been living in a fool's paradise. We have accepted from the European writers, and have developed with wearisome iteration, a doctrine which is not only in flat con-

tradiction to our American phenomena, but which if they were carefully analyzed, would be seen to be in almost equal opposition to the facts of European life. We base our theory of taxation on an explanation which does not explain. It is high time that we should emancipate ourselves from this foolish fetichism.

A few writers have indeed felt that there was something wrong, but have been unable to locate the real point of weakness. McCulloch, for instance, several decades ago, confessed that according to the accepted theory the income tax is ideal; but with the sound common sense of an Englishman he sturdily maintained that in practice the income tax is a fraud, and he contended that indirect taxes were therefore indispensable. Hence his conclusion that equality of taxation cannot be attained, and that what is right must give way to what is expedient and practicable—truly a lamentable conclusion. More recently Mr. Edwin Cannan stated that "economy plays and should play a much greater part, and equity a much smaller part, in schemes of taxation than is commonly supposed." If this were true we might as well abandon the notion that at bottom there is an essential correlation between economic and moral law, we might as well relinquish the belief, so deeply cherished by some of us, that in the long run the true economic welfare of a community is identical with its abiding ethical interests.

But it is not true, and the failure to detect the truth, the inability to perceive the real cause of the clash between the theory and the practice is ascribable to the fact that we have put the emphasis upon the individual, rather than upon the social, aspect of economic law. Let me make my meaning clear.

When we speak of the burdens of taxation, we ordin-

arily think of the individual—of the burden upon one man as compared with that upon his neighbor. For in last resort it is always the individual who pays, either by dipping his hand into his own pocket, or by suffering a diminution in the revenue which he would enjoy if there were no tax. On this assumption we proceed to elaborate our highly wrought theories of fiscal equity. Thus we say that taxes should be proportional or progressive, that equality means relative equality as between individuals in the community, and that the real sacrifice imposed upon one man should not differ from that imposed upon his neighbor.

It is indeed true that writers on finance have been cognizant of the fact that not all taxes are borne by those that pay them in first instance. A chapter or two on the shifting and incidence of taxation is to be found in almost every treatise. But for the most part the distinction has been between direct and indirect taxes ; and in the case of the indirect taxes, which are shifted to the final consumer, it has usually been thought that there is no room for any application of the doctrine of ability and sacrifice. To this is to be ascribed, in part at least, the effort of modern fiscal reformers to diminish the scope of indirect taxes.

But here we have a remarkable situation. It is conceded that when we tax the individual owner of a commodity which is subsequently disposed of by purchase and sale we must regard the economic law governing the transaction and study the consequences which affect other individuals, *i.e.*, the social results. If, however, the owner of the article does not dispose of it directly, but uses it to secure a revenue with which he then parts, we call it by some hocus pocus a tax on property, not a tax on commodities ; and we shut our eyes to the

essentially identical process of economic law. If we sell the sheep in the market, the tax, so it is said, is indirect; if we keep the sheep on the farm, and sell only the wool, we term it a direct or property tax. If a real estate broker deals in land, the tax on the land as it goes through his hands is an indirect tax, and presumably outside of the realm of ability; if he purchases the land, and sells the wheat, the tax is a direct tax, and to be judged by the principle of sacrifice.

This is far more than a mere question of nomenclature. In the one case we follow the working out of economic law through alterations in values; in the other case we assume that there are no such changes. In the one case we regard the social elements in the problem; in the other, we keep our eyes fixed on the individual element. Yet in essence what is the difference? What is the magic which transmutes a commodity into something different from a piece of property. A commodity is an economic concept; property is a legal concept: at bottom a particular article is nothing but a form of wealth, and subject to the laws that govern wealth. Yet the core of economic law is the study of the social relations of individuals. The entire distinction between direct and indirect taxes in the sense that in the one case we have to deal with immediate results, and in the other with ulterior consequences—this entire distinction is illusory. In the one case as in the other the conspicuous fact is the social process.

It must indeed not be forgotten that some writers have in part apprehended this, and have endeavored to elaborate a universal law of fiscal causation. Adam Smith and Ricardo were on the right track but their efforts were largely frustrated by the fact that they centered their attention upon the shares in distribution;

whereas in actual life we cannot reduce our bewildering variety of imposts to the simple categories of taxes on wages, rent and profits. Canard and his slender band of followers went a step further in boldly proclaiming the law of the general diffusion of taxes. But their exposition failed to command assent because they overshot the mark and overlooked the obvious cases where there is no shifting at all. As a consequence, modern theory has proceeded on the assumption that direct taxes at least tend to stay where they are put, and that the ideals of distributive justice are to be attained by an equitable apportionment of such direct charges on the individuals.

It is high time that we realize the fallacy underlying this assumption. As a matter of fact our complex modern industrial society has rendered necessary a transition from the individual to the social point of view, and calls for a study of taxation based on the existence of economic law.

In such a study the two chief factors must be the shifting and the capitalization of taxation. Each of these has been more or less touched upon by previous thinkers, but no effort has yet been made to bring them into harmonious coöperation.

Capitalization is now a familiar conception. If a tax of one per cent is imposed on a corporate five per cent bond, previously selling at par, then if the bonds of other classes of corporations are not taxed the man who buys this bond will pay only $80 for it; he gets $5 interest and pays $1 in taxes, and his net return of $4 bears the same proportion to $80 that the former net return of $5 bore to $100. In other words, the tax is capitalized into the difference of the market value of the bond, and the new purchaser who advances the money

does not bear the tax. As the original holders gradually sell out, the tax in time comes to rest on no individual at all.

The shifting of a tax is not much more complicated, as a conception at least. If a special levy, for instance, is imposed upon houses and reduces the income of the owner, there will in ordinary circumstances be a cessation in house building until with the progress of population rents rise. But if rents rise, the manufacturer or merchant who occupies the structure will be compelled to charge more for his wares; and if these wares are the raw materials for some other product, the rise will be successively transferred from one operation to another until it loses itself in the prices paid by the ultimate consumer.

Let us now combine these two conceptions. The older doctrine of shifting led to the so-called diffusion theory; the newer doctrine of capitalization leads to what I would call the absorption theory. For in such cases the tax is not diffused, but absorbed. Whether, however, the tax is diffused or absorbed, the burden on the individual who comes to be the permanent owner of property ultimately vanishes. The combination of the diffusion and of the absorption theories of taxation results in what I should like to call the final disappearance theory. That is, in all cases where a man parts with his property or with the produce of his property or his earnings—and in modern economic life this is more and more overwhelmingly the rule,—the tax finally disappears as a permanent burden on the individual on whom it is sought to be imposed; although, of course, it does not disappear in its effects, often unlooked for, on the economic progress of society as a whole, or of the various social classes in particular.

If we apply this doctrine to our problem, we are confronted by this situation. Take a tax on land, for instance. In the case of agricultural land, provided that in practice real estate is the well nigh exclusive, or at least the preponderant form, of property assessed, the tax is either shifted by being added to the price of the product or, where conditions do not allow this, it is capitalized into a lower selling value of the land, and when the land changes hands the new purchaser buys himself free of tax. Thus in the course of time the tax is diffused through capitalization or shifting. In city real estate the same is true ; either rents will go up, or prices of lots will go down, and in the end the community as a whole bears the burden.

Again, take personal property. In the case of mortgages it is now fairly well understood that a tax on the man who lends the money does not remain on him, but leads to an increase in the rate of interest, with all kinds of ulterior effects on building operations, and on the general fiscal and economic welfare of society. With personal property invested in corporate securities, the same results arise not only from shifting, but also from capitalization. In the case of the railway bond, mentioned above, the new purchaser does not suffer, but neither does the shipper, provided any dividends at all are earned. But in the case of railway stocks, the depression of market price that would follow the imposition of the tax might result in limiting the investment of new capital to such an extent as to diminish facilities or to raise rates. In the one case we would have capitalization, in the other, shifting. But in neither case would there be any permanent burden on the individual security-holder who purchases after the imposition of the tax.

The same analysis might be applied to all the other forms of taxation. To keep our eyes riveted on the individual taxpayer will only lead us astray.

A new light is thus thrown on the distinction between real and personal taxes. The books tell us that personal taxes are bad because they are inquisitorial. This is undoubtedly true. But tax reformers nevertheless advocate personal taxes, because they think that in this way alone can individual justice be secured. They fail to realize that under modern economic conditions the only kind of a personal tax which can be made to rest on the individual is a poll tax, or a direct consumption tax, both of which all agree in condemning. Under the highly complex competitive conditions of to-day, the general property tax becomes in practice a partial property tax, or a tax on certain kinds of property, irrespective of the question of individual ownership. Under modern conditions a general income tax which is presumed to reach with accuracy the ability of each individual becomes in practice either what the Germans call a *Lug- und Trug System*, a "lie and cheat system," with the burden primarily on the classes unable to pay; or, as in England and her colonies, a series of imposts not on the persons who receive the income, but on the property which yields the income, or on the corporation or the employer who pays the income. In neither case is there any assurance of equivalence between the amount of the tax and the ability of the recipient of the income.

If we recollect that in the ultimate working out of economic law there is no such distinction between real and personal taxes, but that the difference is simply one of administration and not of essence, our attitude to the whole problem is changed and our opinion as to the ethical

superiority of personal to real taxes must be completely modified. The new ideal is a tax on wealth, the old ideal was a tax on the individual who owned the wealth. The new ideal is a tax on the economic process or phenomenon, the old ideal is a tax on the individual subject of the phenomenon. The contrast is striking and profound.

The origin of our present confusion is not far to seek. In the middle ages there was no active competitive life. Land was not commonly bought or sold, corporate securities scarcely existed, and there was well nigh no field for capitalization of taxation. Exemptions were granted to individuals and to classes—not to classes of property, but to classes of individuals owning property, which is a very different thing. Taxes on consumption were so contrived as to fall with crushing severity on the industrious and the worthy. What wonder that the cry went up for justice through individual equality of taxation. And even to-day, in parts of this country where more primitive economic conditions still prevail, there is some saving virtue in a general property tax, as perhaps elsewhere in a general income tax,each considered as a personal obligation. The simpler a community, the weaker are the action and interaction of social economic forces; the more scope is there for the emphasis on the individual factor. But in the more complex society of to-day, the society of competitive capitalism, of mobility of economic agents, of large industry and modern media of communication, the problem is no longer that of the individual, but of the effect of economic law on the various classes of society, on the agencies of production and on the facts of group, rather than individual, consumption. What I have called the disappearance theory of taxation rests on the facts of social production and of group consumption.

What are the conclusions to be drawn from this theory? They can be put succinctly as follows: Under conditions as they already exist in a large part of this country, and as they are fast coming to exist in the remainder, the effort to secure justice in taxation does not imply the need of considering only the individual. It is not necessary to impose a tax on general property, for the same result can be reached by taxing only special classes of property, provided of course that we do not repeat the mediæval error of exempting particular individual owners within each class. It is not requisite to tax all corporations, since it suffices to tax only certain classes of corporations. It is not necessary to tax all incomes, when the same end can be attained by taxing certain specific sources of income. Above all, while we do not need to tax all consumable commodities, as by the general excises of former days, it is equally unnecessary to apply the predicate "just" to direct taxes, and to withhold it from indirect taxes.

But I must not be misunderstood. In our impatience with the old doctrine, we must be careful not to jump too far to the other extreme. While it is true that property taxes which are not shifted tend, according to the absorption theory, to be capitalized, thus exempting the future owner, the burden still remains on the present owner. That is the very meaning of absorption, as opposed to diffusion. Final disappearance does not mean immediate disappearance, and in many cases the immediate results are the important ones for the individual. It is manifestly unfair to make the present bear all the load of the future.

Hence it behooves us to go slowly. We must hesitate before levying high special taxes on particular kinds of business for fear of injuring the business itself, and thus sacrificing both future and present. We must pause be-

fore accepting the scheme of our single tax friends, because their basis is too narrow, and the sacrifices demanded from the present owners of land are too heavy. *Per contra*, we need not accept the old project, now again furbished up and presented by some, that the ideal impost is a tax on all forms of productive capital,—for quite irrespective of its magnificent impracticability, the theory of capitalization renders it quite unnecessary.

Our American system is therefore moving in the right direction. We do not levy our so-called indirect taxes indiscriminately as of old; but apart from the tariff, the importance of which is only secondarily fiscal, we limit the subject of federal taxation to a very few articles of widespread consumption. We no longer in our most advanced states attempt in practice to levy a general property tax, but are content, as is almost true in New York to-day, with state taxes levied not on individuals, but on inheritances and corporations. Finally, while in local taxation we still hold to the theory of a general property tax, in practice we are fast coming to the well nigh exclusive taxation of real estate.

But whereas we are moving in the right direction in these commonwealths where the conditions are ripe, simply because the economic facts are too strong for the law, the law still conforms to the old theory. And the difficulty of altering the law is ascribable to the fact that neither our statesmen nor our economists have yet been able to frame a theory which will at once explain the conditions and respond to the sense of justice in the popular mind. Let us hope that when once we shall have realized the true implications of this newer theory which emphasizes the social aspects of economic law, we shall be able to prove to the satisfaction of all that in order to secure justice we do not need to impose a tax which seeks equally to hit in first instance every indi-

vidual member of the community. We shall then grasp the fact that while equality from the individual point of view means equality as abstracted from class differentiation, equality from the social point of view means equality only within the class, and is compatible with an ostensible inequality between the classes. For here as elsewhere, all is not what it doth seem, and the apparent original inequality, when subjected to the crucible of social analysis and social process, resolves itself into a higher equality.

In conclusion, then, let us not minimize the revolutionary character of the general principle which is the burden of my theme. I submit it indeed with diffidence, but with a firm conviction that if true it is destined to lead to important results. If the social aspect of economic law is really as significant as I think it is, we must rebuild large parts of our economic edifice. We must recognize that the psychological school of economics has gone off on a wrong tack, not because they emphasize psychology, but because their psychology is not of the right kind; we shall have to confess that the opposition between the cost theorists and the utility theorists, is to a great extent needless; we shall have to revise our attitude to the problems of international trade, of private property, of the relations of labor and capital; and above all, we shall be compelled to rewrite our works on Taxation and Finance.

Let me trust, however, that there will be no misconception of the real bearing of my contention. The subordination of the individual to the social element in economic life and law does not imply any depreciation of the individual as such, nor does it mean that the ideal polity of the future must resemble the crude socialism that is so loudly proclaimed by some. For all human beings, after all, the goal of endeavor must be the perfec-

tion and the fruition of those latent qualities and possibilities that distinguish us from the brutes and that constitute our personality. Moral development means self-development, and progress can come only through freedom. Individualism in this sense is the very goal of all achievement.

We must, however, not forget that the individual has become what he is largely through society. Let us remember that side by side with the individual struggle for existence, there has been the group struggle and that, as has recently been pointed out, the mutual aid within the group has been the very condition of the contest between the groups. Let us remember that the individual as he exists to-day has been hammered out by society, that individual ethics is the result of social ethics, and that individual progress is largely the consequence of social progress.

Economics, politics and ethics are each of them a part of the greater social science. In each of them we find the universal problem of attaining unity in multiplicity. The aim of economics is to show the reconciliation of private wealth with public welfare; the object of politics is to secure individual liberty through a free commonwealth; the goal of ethics is to prove that individual morality is in harmony with the very conception of the universe. Economics shows how a prosperous individual can come only through a prosperous society; politics teaches how a free individual can persist only in a free society; and ethics makes it clear how a perfect individual can be conceived only as a constituent of a perfect society. Prosperity, freedom, morality—all alike are at bottom social conceptions. They can be reached in practice only through a common striving together; they can be comprehended in theory only through an analysis which accentuates the social element.

ADDRESS OF WELCOME

EDWIN A. ALDERMAN

I give you a very hearty welcome, gentlemen of the American Historical and American Economic Associations, to the lower South, to the city of New Orleans, and to Tulane University. Your presence here adds a certain charm and distinction to this gracious holiday season. We, to whom this city is home, desire to make it a real home for you, though the roof-tree that shelters you may be many leagues away. We are glad to have you here, not only for yourselves, but because we believe that you can help us to deal wisely with our problems, which are many and grave. The historian and the economist are to me the most interesting of men. Their laboratory is humanity, and their aim a state of society in which men can make the most of themselves. The task is an appalling one, but I believe the names of some of you will be held in honor by men, because of this aim, when the more dramatic figures you study, as they stagger under the burden of their millions, will be quite forgotten save as mere social phenomena.

You have come, I think, to a very fascinating portion of the most fascinating nation on earth, considered from the standpoint of the historian and the economist. Certainly, nowhere else on earth is there offered to thoughtful men a more interesting study in social self-realization or in the course of this great democratic experiment. The noble lines of a wonderfully human experience are visible on its face—experience of sorrow and loss and disaster, of battle and seige and pestilence, of joy and pride and achievement. No Francis Parkman or Theodore Roosevelt has told the story of the "Winning of

the Southwest." Great deeds have been done here. Here an empire was born, and here a great battle was fought which gave a hero to democracy, and thus gave to democracy its opportunity.

The New Orleans that you honor with your presence to-day is a community of boundless hope, of almost joyous self-reliance, of an exhilerating realization of independence and self-consciousness. The Southern seaboard is coming into its own, for the balance of commercial activity is tipping, surely toward this American Mediterranean. This spirit of hope is more subtly expressed, however, than in the roar of mighty bull campaigns, or in the volume of export statistics. The divine philosophy of defeat is revealed in this spirit. It is a kind of mental exaltation, marking the reconstructive work of men who have brought the city through the most thorough-going social revolution of modern times by the use of such empire-building tools as patience, grimness, energy and faith.

The spirit of this metropolis is the spirit of the whole region. For forty years the South was practically another nation, building its social order on the basis of an inherited economic misconception. For another forty years it has been striving to retain its best traditions, its idealism and its simplicity, to recover the industrialism in commerce and education which it had lost, and to achieve nationalization in politics and liberalism in opinion. The South has regained the spirit of industrialism with which it started. Many details remain to be worked out, but the spirit is there. By industrialism I do not mean commercialism. Commercialism is a mere sordid theory of life. Industrialism is the scientific mastery of the raw material and its wise disposition according to the laws of trade. Thus considered, indus-

trialism is a mighty and a moral part of the movement of society. When the practice of industrialism catches up with the spirit, politics will be nationalized and thought liberalized in the South, for the economic structure of society is largely responsible for its ideals. Our real problem, therefore, is to try to industrialize our society without commercializing its soul. I wonder if the thing is possible?

The tragic fundamental fact in Southern life is an economic fact—the presence here in large numbers of the African as a great economic factor. There has not been a moment in sixty years, largely owing to his presence, that the South has not passionately subscribed to one of two or three great political dogmas or doctrines. We are, as a consequence, the sturdiest political metaphysicians of our race with a capacity for political solidarity that is almost distressing. For sixty years the South stood ready to die, and did die, for the doctrine of state sovereignty. To-day it would die with even more amazing oneness of mind for the doctrine of racial integrity or the separateness of the two races. This does not mean race hatred. There is a certain amount of race hatred, of course, and there are reasons for this, but the best Southern people not only do not hate the negro, but come nearer to having affection for him than any other people on earth, and they hold this faith in a spirit of common sense and justice and sympathy and helpfulness to the black race. They are too wise not to realize that posterity will judge them according to the wisdom they use in this great concern. They are too just not to know that there is but one thing to do with a human being, and that thing is to give him a chance, and that it is a solemn duty of the white man to see that the negro gets his chance in everything save social equality and po-

litical control. The Southern people believe with their usual intensity that it is the duty of civilization always to protect the higher groups against the deteriorating influence of the lower groups. This does not mean that the lower should be prevented from rising, but that it should not be permitted to break down the higher. The improvement and progress of the backward nations and races should all come by improving the condition of their own group, but should never be permitted to come at the expense of the higher or more advanced group, nation or race. Social equality or political control would mean deterioration of the advanced group, and the South is serving the nation when it says it shall not be so. But I am not here to discuss this question. Discussion of it has become a national disease and should be quarantined against, for it is getting hysterical and dangerous. The doctrinaire and magazine writer thought they had settled it thirty years ago. How foolish seems their talk to-day! My prescription is "silence and slow time," faith in the South and wise training of both white and black.

The idea I wish to present, however, is this. A people who hold to high political doctrines, which do not admit of compromise in their minds, gain in a genius for intensity of conviction what they lose in liberalism. They become idealists—possibly martyrs to an idea. Great virtues, like unsordidness, unselfishness, simplicity, patriotic devotion, come to dwell within them. They cease to fear anything but denial of their doctrines. You can not frighten them with poverty, oppression, obscurity or any other terror. You can not cajole or deceive them. They become single-minded and self-centered. It is plain to me that by the very tragedy of its history, the South is the most idealistic section in

America to-day. New England was forty years ago. Industrialism has diminished idealism there, though not moral persistence or love of order. The South to-day wants wealth and success and power, and is hot-footed on the trail of it, but it would imperil all for its dogma. It is still a land of enthusiasms, loyalties, principles and slogans. It still loves a good generous phrase like "the consent of the governed." No other people except the French will so quickly rally around a phrase, or a doctrine, or a song, or an attractive personality like the Americans of these Southern states.

Now, I believe that America needs this intense idealism of the South, stamped into its life by its sad, strange history. The nation should thank God that it is here, for after all, it is a spiritual force needed to help combat vulgar strength and coarse power. I have said that industrialism will change this idealism, and so it will, but it is too deep for destruction or submersion. For generations it will play about some phase of national life, for sectionalism as a philosophy or a creed has gone forever, unless it shall be galvanized into life again by the harmonious coöperation of Senator Tillman and the Union League Club. It was travelling fast toward the conception of national unity, for which it stood so grandly in the early days, when, somehow, it got shunted off, but it will return to that—at least, so runs my dream, and so points my logic. Whenever this vast grip of Southern idealism takes fast hold of the idea of national unity, of national destiny, of national hope, the great republic that we all love and count it a glory to serve, will feel its buoyant power as men in the valley feel the tonic of the upper altitudes. I wish for you, gentlemen of the two Associations, a session of freedom of speech, of wealth of learning, and of much pleasure and profit.

SUGAR

WILLIAM C. STUBBS

In discussing "Sugar" before this Association, it will I hope, be remembered that I am a Louisianian and have spent many years of my matured manhood in the study of the sugar cane, and if therefore in my remarks I confine myself mainly to this plant, it will be another verification of the old adage that "out of the abundance of the heart, the mouth speaketh."

DEVELOPMENT OF THE INDUSTRY

The sugar industry of Louisiana began in 1794, nine years before the Louisiana Purchase. Starting with the $12,000 commercial crop of Etienne De Boré, grown upon the grounds of the present Audubon Park in 1795, the industry has expanded until it occupies a goodly portion of the South Atlantic and the Gulf coasts from South Carolina to Mexico.

In Louisiana and Texas sugar is produced in large quantities. Elsewhere syrup alone is manufactured, though near Bainbridge in Georgia, a sugar house has recently been erected for the purpose of essaying the manufacture of sugar. In spite of the many serious obstacles, the sugar cane industry has grown and expanded until the average annual output is not far from $40,000,000.

The sugar house in this time has undergone several radical transformations. De Boré's horse mill and iron kettles have, through an almost continued process of evolution and improvement, eventuated in the central factory of to-day with its ponderous mills and crusher,

or diffusion batteries, superheaters, filterpresses, triple effects, vacuum pans, centrifugals, crystallizers and granulators. One similarity remains. Once the oxen propelling the mills were fed upon the tops of the canes they were crushing; to-day, the refuse of the cane, the bagasse, constitutes the main fuel under the boilers, where steam is generated which propels the mills that crush the cane and evaporates the juice obtained therefrom. So great indeed have been the changes in our modern central factories that an ante-bellum planter would not recognize one as a sugar house at all.

The agriculture of sugar cane has kept pace with its manufacture. The old mould-board plow and home-made harrow have long ago been succeeded by the improved turn plow and revolving harrow, and these in turn have been supplanted by the disc harrow and plow. Improved labor-saving cultivators have largely displaced expensive hoe gangs, and the cane harvester now being evolved from the brain of genius is everywhere awaited as the first valuable contribution of the new century to the great sugar cane industry of the world. The "Louisiana Sugar Planters' Association" has a standing prize of $2500 for such a machine. Drainage is recognized as a prerequisite to large crops, while irrigation is appreciated by all and practiced by few. The alluvium of the Mississippi delta, once regarded as inexhaustibly fertile, is to-day manured annually with thousands of tons of tankage, cotton seed meal and acid phosphate.

These marvelous developments have been evolved from numerous and sometimes seemingly insurmountable difficulties which have attended the industry from the beginning. Floods have repeatedly inundated whole sections and destroyed thousands of acres of cane.

Pestilence "that walketh in darkness" has several times laid a heavy hand upon large districts. The Civil War almost annihilated the industry, fifteen to twenty years being required for its partial recuperation. Low prices and unreliable labor have frequently shorn the industry of its profits. Unfriendly legislation has brought the coolie-raised or bounty-fed sugars of other countries into direct competition with that grown in the South. And lastly, and perhaps the most serious obstacle of all, is the want of permanency in our national legislation, a defect inherent in our form of government which gives the people the opportunity of overturning the "powers that be" every four years. These obstacles have developed self-reliance, investigation, study and thought, and to-day Louisiana is justly esteemed the leader of the sugar cane world, and is sending words of intelligence and experience to every tropical sugar country.

This progress, wonderful as it has been in the aggregate, has been obtained through much suffering, large expenditures of money, and thorough practical and scientific experimentations. It may be truly said of Louisiana, that nearly every dollar made by the sugar planters since the war has been utilized in the improvement of their estates, and in the reconstruction and enlargement of their sugar houses, until to-day they represent, altogether, an investment of $100,000,000.

INTRODUCTION OF CANE SUGAR

Time and space forbid a detailed account of the introduction of the sugar cane into Louisiana by the Jesuits in 1751, and the many unsuccessful attempts at sugar making before 1795, the immoderate use of taffa, a rum made from the juice of the cane, and the excite-

ment and interest attending De Boré's successful attempt at commercial sugar making in 1795 which stimulated scores of planters to follow his example, thus inaugurating the sugar industry of Louisiana and the South. The names of Dubreuil, Mazan, Destrehan, Mendez, Solis, Morin and De Boré are inseparably connected with the early history of sugar cane in this state.

The first cane introduced into Louisiana was the Malabar, Bengal, or Creole variety, from which De Boré made his first crop of sugar. The Tahiti variety was introduced about 1797, and with the Creole, furnished the seed for the planters until John J. Coiron introduced the striped and purple varieties from the coast of Georgia in 1817 and 1825. These varieties soon supplanted the others and gave by their superiority an additional impulse to the sugar industry. It may not be out of place here to mention an appropriation by Congress in 1856 of $10,000 for the purpose of obtaining cuttings of sugar cane of such varieties as were best suited to the climate of the Southern states. The Commissioner of Patents, in coöperation with the Secretary of the Navy, provided two expeditions to secure these canes. One went to the Straits Settlements and brought back the Salangore variety, which was so badly rotted on arrival as to give no results.

The brig Reliance, with Mr. Townsend on board as entomologist, visited British Guiana and Venezuela with specific instructions from Commissioner Brown to bring back certain varieties found near Caracas. Mr. Glover brought back 1008 boxes early in 1857. The newspapers of that day were filled with severe arraignments of all parties engaged in the introduction of these dead and worthless canes, but Commissioner Holt in his an-

nual report for 1857, speaks of the promising condition of the canes imported into the South from Demerara which "in the end amply compensate for the trouble of introducing them." The evidence is contradictory, but it is well known to our older planters that no canes grew from either of these importations.

In 1872, Mr. P. M. LaPice on his return from Java brought back with him a white cane which now bears his name, and which is quite largely cultivated in certain localities of this state. Mr. DuChamps imported the Purple Elephant variety in 1875, and Mr. Palfrey of St. Mary parish, introduced about the same time the Bourbon variety, which locally bears his name. Mr. LeDuc, the Commissioner of Agriculture in 1877, caused to be imported from Japan a peculiar variety called Zwinga or Japanese cane. It is an excellent hardy variety, stooling well. The stalks are very small, and though of little value to the sugar planter of Louisiana, it has recently found high favor with the small farmer in Florida for the manufacture of syrup. In 1886, the Sugar Experiment Station, through the kind offices of Commissioner Coleman, began the importation of foreign canes and now has over seventy-five varieties growing upon its grounds.

All efforts, however, to increase the sugar yields by a selection and acclimation of foreign varieties have been entirely suspended by the discovery of the ability of the cane seed (hitherto deemed infertile) to germinate and produce "seedlings." Now every sugar country is producing annually thousands of seedlings and from them propagating those which promise the largest tonnage with the highest sugar content. The Sugar Experiment Station of New Orleans has experimented with a

number of these seedlings and has distributed in large quantities two of the most promising ones, no. 74 and no. 95, to the planters of this state. These seedlings are meeting with great success and hope is confidently entertained that they will ultimately supplant all other varieties and greatly increase the output of our sugar houses.

OUTPUT

It would be curious to trace the fluctuations in our sugar output since 1795. Freezes, overflows, droughts, excessive rainfalls, variations in the prices of sugar and cotton, have been some of the local disturbing influences, while national legislation has always exercised a profound effect. It may be mentioned that in 1844 and 1845, on account of the low price of cotton, the cultivation of the sugar cane was extended to the upper parishes of this state and to Mississippi. This successful extension of the sugar industry into the cotton fields alarmed the sugar planters of the coast who positively asserted that with the high tariff of 1842 on sugar and the low price of cotton, that the entire cotton belt would go into sugar culture and ruin the industry. This is the only mention in history of the objection on the part of any sugar planter to a high tariff on sugar. The average crop of Louisiana is now not far from 300,000 long tons of sugar, though the crop for the year just closing, on account of an unfavorable season, will probably be ten per cent less.

The most serious obstacles heretofore encountered by planters in the successful growing of cane sugar have been the occasional crevasses and overflows. With sugar cane, where the stalks are planted and where from two to six tons of cane per acre are required for seed, an over-

flow is often fatal to a planter. Several years will be required to grow enough cane to re-plant and re-establish the prevailing rotation on an estate, and few planters can stand such a disaster. In 1887 Congress created the Mississippi River Commission, whose duty it is to improve the navigation of the river and works connected therewith. Its duties included the construction and maintenance of levees. This action by the national government was promptly seconded and supplemented in Louisiana by the creation of levee districts, governed by levee boards with power to issue bonds, levy and collect specific taxes, and erect and maintain efficient levees. There are about a dozen of these districts in the state, and from the bonds sold and taxes collected, supplemented with appropriations from the Mississippi River Commission, the levees of the state have been rebuilt, strengthened and raised above the highest watermark known. It is believed that the day of overflows has gone.

I have already alluded to the tariff and its influence on the sugar industry. The first duty levied on sugar was in 1789, which was augmented in 1790, 1797 and 1800. These duties were imposed at a time when there were no lands within the United States suitable for sugar cane and no sugar cane was grown. In the war of 1812 the duty was five cents per pound, but was lowered to three cents in 1816. They were levied for revenue only, and the tariff of 1816 continued until the compromise act of 1832. Since that time sugar has been the foot ball of each political party and has been subjected to frequent and severe tariff changes. Since the establishment of the United States in 1789, the tariff on sugar has been changed twenty times, fluctuating

between three-quarters of a cent in 1861 and five cents during the war of 1812. From 1890 to 1893, brown sugar was admitted free, but the sugar producers were paid from one and three-quarters to two cents per pound bounty. With this exception, sugar has always been an important source of revenue to the general government, the duty averaging about two cents per pound. Permanency in national legislation is almost necessary to the continued prosperity of any industry.

THE PLANT

Sugar cane is a gigantic grass of the genus "saccharum." All cultivated varieties are classified under one species, "saccharum officinarium." Cane goes to seed in tropical countries, but the seed are small, with much adhering pappus, often infertile, and germinate with difficulty. They are never used for planting the crop, but are germinated in experimental work for originating new varieties (seedlings). The cane crop of the world is propagated by planting the stalks, as in Louisiana, or the tops of the stalks, as in many tropical countries. The stalks are made of joints and at each joint is a bud or eye, which develops by planting into a stalk. Each stalk soon tillers until a bunch of stalks is produced.

PREPARATION AND CULTIVATION

The ground is thoroughly broken with disc or mould board plows, drawn by four to eight mules. Rows from five to seven feet wide are thrown up with two-horse plows. An open furrow is made in the center of the row with a double mould board plow. Into this open furrow are deposited two to four continuous lines of canes. These are covered by a plow or cultivator, followed by hoes, and the process of planting is completed. Two to

six tons of cane are used to plant an acre. As soon as the cane begins to sprout, the rows are off-barred on each side with a two-horse plow and the dirt covering the cane is partially removed in order to hasten the process of germination. When a good stand of cane has been secured the dirt is returned, the middles of the rows are opened and the process of cultivation begins. This is accomplished with plows, cultivators and hoes, and is continued until the cane is large enough to shade its rows and prevent the growth of weeds and grass when it is laid by. The ditches are then well opened and the quarter-drains cleaned. This is the final act in cultivation. Cultivation is best accomplished by the use of cultivators, the disc to straddle the row of cane, and the "diamond toothed" to split out the middles.

Cane is planted at any time between September and April that the convenience of the planter and the weather and condition of the soil will permit. It is usually laid by in June or early in July. After "lay by" the cane grows rapidly, particularly if frequent showers at short intervals conspire with warm weather. In Louisiana the general harvest begins in October, and lasts till January. On account of the severity of our winters, cane must be harvested in the fall and early winter, or be killed by the frost. It is therefore only about eight or nine months old when worked in the sugar house.

EXTRACTION OF THE JUICE

There are two processes of extracting the juice from the cane, pressure and diffusion.

The juice from the sugar cane is usually extracted by passing the canes through heavy iron rollers driven by powerful engines. A combination of from three to nine rollers constitutes a sugar mill. The more numer-

ous the rollers, other conditions being the same, the greater the quantity of juice extracted. Many sugar houses have in front of their mills, crushers or shredders, which prepare the canes for the mill. Frequently after the canes have passed through the first set of rollers (usually three) they are saturated with water or steam and then passed through another set of rollers. By this process, known as "maceration," a larger extraction of juice is obtained. This is usually practiced in large mill houses, giving extractions of 75 to 84 per cent of juice on the weight of the cane.

The second process is by diffusion. Beets have always been treated by the diffusion process. Recently the same process has been used with sugar cane. The process, briefly, is as follows. The canes or beets are cut up into small pieces by specially designed knives and carried into large, cast-iron cells, known as diffusors. There they are treated with hot water under pressure. Ten to sixteen cells constitute a battery. The juice is driven out by force from cell to cell over fresh chips, until it contains nearly as much sugar as the natural juice in the plant, when it is drawn off and sent to the juice tanks to await the treatment described further on. When water has passed over the chips a sufficient number of times to remove nearly all the sugar (a fact determined by chemical analysis), the cell is opened from its lower end and its contents dropped on a carrier, which conveys them away. When the cell is again closed below it is at once refilled with fresh chips from the top. In the continuous march of diffusion work, one cell is being emptied and one being filled all the time, the rest being filled with chips and closed, subject to the constant flow of juice. To each cell is attached a heater or "calorisa-

tor," and through this the juice is made to flow in its passage from cell to cell.

CLARIFICATION

The juice obtained is subjected to the following treatment. If white or yellow sugar be desired the juice is treated with the gas obtained by burning sulphur. This bleaches it. It is then drawn into large copper vessels, holding from 400 to 1500 gallons, with steam coils at the bottom, called "clarifiers." Here it is treated with milk of lime until the acidity of the juice is neutralized, and then it is heated nearly to the boiling point of water. This treatment brings to the surface a heavy blanket of impurities which is brushed off into another receptacle and finally sent into a filter press, where the juice is expressed and the solid impurities remain imprisoned between the plates of the press. When the filter press is full of this solid substance, it is emptied and made ready for fresh work. Superheated-clarifiers are used in many factories.

After cleaning, the juice is evaporated quickly to a syrup containing about 40 per cent of sugar. This evaporation is performed in open pans, or in closed vessels, in each of which a partial vacuum is maintained. Direct steam is used in the former, while exhaust steam from the engines, pumps, etc., serves the latter. These closed vessels are called "effects," single, double, triple, or quadruple, according to the number used. The principle is this: exhaust steam is made to boil the juice in the first vessel where 10 to 15 degees of vacuum (20 to 15 degrees of pressure) are maintained; the vapors from the first vessel are made to heat the juice in the second vessel where a vacuum of 25 to 28 degrees is held, etc. The vacuum in each vessel can be regulated at the

pleasure of the operator, according to the number of vessels used. By this process the evaporation is performed at a minimum expense and at a temperature considerably below the boiling point of water, thus escaping the danger of caramelizing sugar, a thing frequently done in open vessels at high temperature.

By either of these processes a syrup is obtained which is sent to the vacuum strike pan where it is granulated. This pan consists of a closed vessel with three or more interior coils, situated one above the other, through which the steam may circulate. To this pan is attached a vacuum pump, which removes the air and vapor from the pan as fast as formed. The vapor is then condensed by a constant stream of water flowing through the pump. When the proper vacuum is obtained, usually 26 to 28 degrees, the syrup maker takes his first charge of syrup, turns heat into his lowest coil, and begins again the process of evaporation. By gradual charges enough syrup is concentrated to begin the formation of the grain. As the pan is filled, the different coils are opened and additional steam turned on. After concentrating the syrup to a sufficient density small grains begin to appear. These are examined at short intervals by removing a small quantity on a proof-stick, and when sufficiently numerous, the process of building the grain begins. This is done by carefully feeding them with fresh syrup taken in, in small quantities, at short intervals. Finally the grain has grown to the proper size, the pan is full, and a strike must be made. Before the latter is performed full heat is turned in on all the coils, the grains are hardened and the entire mass cooked to the proper density. Then the bottom of the pan is opened and the stiff semi-fluid mixture of sugar

and molasses, called "masse cuite" is emptied into a large mixer, where revolving paddles keep it from solidifying. From this mixer it is drawn into centrifugals which, revolving at the rate of 1200 to 1500 times per minute, throw out through the fine sieves the fluid molasses and retain the sugar.

The molasses is caught in the lower basket and directed to a large receiving tank. After the molasses has been removed the sugar is washed with more or less water, or pure sugar syrup, according to the quality of sugar desired. In this way brown, yellow clarified or white sugar may be obtained, at the option of the operator. These are called first sugars. Frequently, when yellow clarified sugar is desired, the wash water contains a small quantity of some salt of tin to give the sugar a desirable yellow tint.

The yellow clarified and white sugars thus made go at once into commerce. Sometimes the latter is granulated before offering it on the market. The instrument used is called a granulator and consists of a large, hollow revolving cyliuder, so arranged that the sugar conveyed into it at one end is carried slowly through it, and during its passage is heated to expel the last trace of moisture. It emerges as granulated sugar and has the advantage of not caking, even in the dampest climate. The brown sugar made as above, formerly went into consumption as such, but now goes almost entirely to the refinery.

The molasses thrown off by the centrifugals, in the above operation, is drawn up again into the vacuum pan and cooked either to grain with fresh syrup and centrifugaled, or to such a density that when a small portion of it is drawn between the thumb and finger it

will string out into a fine thread before breaking. When this density is obtained the mass is emptied either into crystallizers stirred by paddles, where it grains quickly, or into iron wagons and rolled into a hot room, where a constant temperature of 110° to 115° F. aids the granulation of the contained sugar. This process is called cooking to "string" and its sugar "string sugars," in contradistinction to "grain" and "grained sugars." In a few days the mass, either in the crystallizers or in hot room, becomes charged with crystals and the latter are separated by centrifugals. It is almost impossible to obtain other than brown sugars by this process, and of course they go to the refineries. They are known as "second sugars" or "seconds." The molasses from the second sugars is again subjected to the same treatment, and the sugars therefrom are called "third" sugars or "thirds." Sometimes "fourths" are made. The final molasses finds its way to the markets either in barrels or in tank cars under the name of centrifugal molasses. It is black, thick and uninviting, containing but little sugar, and possessing very little value.

"OPEN-KETTLE" FACTORIES

Unfortunately not all of our factories are so advanced. The open-kettle sugar house still exists, although the number is gradually diminishing. The methods of extraction of juice by mills is similar to that described above. It is evaporated differently. Four large iron kettles arranged in a line, encased in brick, with a continuous furnace under them, constitute the outfit. These kettles, descending in regular order in size, are known as the "grande," the "flambeau," the "sirop," and the "batterie." The juice, after being sulphured,

is drawn into the grande, where it is limed, heated and the scums removed. It is then dipped into the flambeau, where it is brushed and cleaned, then passed to the sirop, where it is further brushed, and finally into the batterie, where it is concentrated to the granulating point—a density of about 45°–50° Baume, and with a temperature of about 240° F. At this point it is dipped out and run into long troughs, called coolers, placed in the purgery. In a few days this "masse cuite" becomes solid, and preparations are then made for "potting." This process is as follows. In every open-kettle sugar house is a room called the "purgery." The floor of this room is cemented and inclines from every direction toward a large cemented cavity known as the molasses cistern. In this room the potting is done. Empty hogsheads are brought in and three one-inch sugar holes are bored into each bottom. Into each hole is inserted a large stalk of cane with the end cut in the shape of a trianglar prism and its sides beveled. After placing the hogsheads in position they are filled with the "masse cuite" from the coolers. By the aid of spades and shovels the "masse cuite" is dug up, the lumps pulverized and transferred to the hogshead. The molasses following the beveled edges of the canes percolates downward and emerging through the auger holes in the bottom, flows over the cemented floor into the molasses cistern. In a few weeks the sugar is drained of its molasses. The hogshead of sugar is headed up and shipped off to market. Little or none of this sugar now reaches the consumer. It is sold to the refineries.

It is not so with the molasses. If the operations have been carefully performed the molasses is excellent and commands fairly remunerative prices. It is called

"open-kettle molasses" and is held in high esteem. Sometimes a small well is dug into the solid mass of the cooler. Into this well percolates the molasses which is dipped out as fast as it accumulates. This molasses is called "bleedings," and is in large request at high prices. But little, however, is made.

Another product of the open-kettle sugar house is syrup or "sirop de batterie." This is the well clarified juice concentrated to a syrup in the batterie or last kettle, in which ordinarily the strike sugar is made. It is highly esteemed and early in the season brings extravagant prices.

Popular error exists as to the terms molasses and syrup. The former refers always to the drainings from the sugar, while the latter is the concentrated juice of the cane with all the sugar in it. The former will not easily ferment or crystallize, and therefore can be kept for a long time. The latter, if too concentrated, will granulate, and if too thin will ferment. It therefore cannot be kept a very long time without sterilization.

Often instead of evaporating the juice in kettles heated from underneath by an open fire, a series of pans are arranged, each with steam coils in the bottom. The juice is clarified and brushed in the first and concentrated in the remainder, the last one of which is the "strike pan." These are called steam trains.

GRADES

We have considered the usual products manufactured by the sugar houses directly from the raw material. These products are shipped to market and sold either for consumption or for refining. Nearly all of the open-kettle and the second and third centrifugal sugars go to the refiners, little or none going directly into the

trade. On the other hand, nearly all of the first centrifugal sugars go directly into commerce, provided they have been properly washed, and are sold for consumption to our groceries.

On the Sugar Exchange in New Orleans the following classifications have been adopted for plantation products. For centrifugal sugar: "plantation granulated," "off granulated," "choice white," "gray white," "fancy yellow," "choice yellows," "prime yellows," "off yellows," "seconds." For open-kettle sugars: "choice," "strictly prime," "prime," "fully fair," "good fair," "fair," "good common," "common inferior." For both open-kettle and centrifugal molasses: "fancy choice," "strict prime," "good prime," "prime," "good fair," "fair," "good common," "common," "inferior."

Color alone determined the above classification, and until recent years was the only factor which gave value to the sugars, syrups or molasses. Now everything destined for the refineries is subject to polariscopic tests and the percentage of sugar therein is the ruling factor. Open-kettle sugar rarely surpasses 90 degrees polariscopic tests and seldom falls below 80 degrees, while first centrifugal sugars rarely fall below 90 degrees and sometimes go over 99 degrees. Chemically pure sugar gives 100 degrees. Syrup, when bought by the refinery, and molasses when bought by the distillery, are both subjected to chemical analyses which determine their values.

HOW PACKED

All centrifugal sugars of every grade are packed in barrels holding about 350 pounds, while open-kettle potted sugars are shipped in hogsheads holding from 1000 to 1500 pounds. Molasses and syrups are sent to

the consumers in barrels holding about 50 gallons each. To dealers, molasses is often shipped in tanks located on a flat-car. It is pumped into the tanks from the sugar houses, and pumped from the tanks into large cisterns when received at its destination.

MIXING AND BLEACHING MOLASSES

A large trade is carried on in mixing glucose syrup, made from corn, with Louisiana molasses. This mixture is sometimes branded "Louisiana syrup" or "molasses." So great has become this industry that it is difficult to buy a brand of pure Louisiana molasses, except from first hands on the levees.

Brightening dark molasses has also become quite a business in some quarters, and specially prepared chemicals are sold for the purpose. Much of the black centrifugal molasses is thus bleached and sent into the market at higher prices. This will continue despite the laws against it, just so long as the trade buys its goods on color. Thanks to the prevailing low prices, little or no adulteration can now be found in the sugars of commerce.

CONDITIONS AND PROSPECTS FOR CANE SUGAR

Taking a retrospective view of the sugar industry of Louisiana for the last fifteen or twenty years, it can be said with truth that there is no industry in the world that has made such progress. The organization of the Sugar Planters' Association in 1877, may be regarded as the starting point of the renaissance of the sugar industry. Since that time the Sugar Experiment Station has been established, whose teachings and experiments have illuminated the field and the factory. The *Louisiana Planter and Sugar Manufacturer* has been

started, whose weekly visit to the home of every planter, manager, overseer, and sugarmaker, carries with it information upon every subject pertaining to the agriculture of sugar cane and the chemistry and manufacture of sugar. The Sugar Exchange has been created in New Orleans, where the products of the plantations are quickly sold.

Small sugar houses are fast disappearing, and enormous factories with every modern labor and fuel saving apparatus, are to be found in every section. The output of sugar, both per acre and per ton of cane, has been greatly increased.

The crop of 1902 brought about $30,000,000, and gave employment directly and indirectly to nearly half a million of people. Every dollar received was exchanged for labor, material, provisions and clothes. This large sum is paid out as fast as received, and a portion of it doubtless finds its way to every state in the Union, thus creating an inter-state commerce of nearly $60,000,000.

The Brussels convention, by abolishing the export bounties and cartels, has caused a reduction of the European beet sugar output. With the abolition of the bounties has come also a reduction in the internal revenue charges on sugar in several countries, with a consequent increase in domestic consumption. It is reported that the European beet sugar crop of this year is 1,000,000 tons below that of its predecessor. The menace to the cane sugar interests which previously existed in Europe's beet sugar surplus, has been materially modified. Hamburg no longer fixes the price of sugar in the American markets. The advantage hoped for through this reduced production and increased con-

sumption in Europe, has been largely destroyed by a notable increase in the production of cane sugar in the tropics, particularly in Cuba.

The United States must take this surplus of cane sugar, and hence our markets are not yet materially affected. Despite the reciprocity treaty now in full effect, January deliveries of raw sugar from Cuba are offered at 2.15 cents per pound, as against 2.06 of last February. The United States will consume this year 2,650,000 tons, of which about 1,000,000 will be furnished by domestic sources. The cane sugar of the tropics will more than supply the remainder.

One fact, however, is patent. The supremacy of European beet sugar is gone. Cane sugar under scientific and systematic direction has regained its sway and will doubtless hold it until the end of time.

SUGAR—DISCUSSION

JOHN DYMOND: Louisiana, as a colony, quickly developed into plantations, and when Etienne Boré, a century or more ago, made sugar manufacture an industrial success, our present great sugar industry, and our plantation systems were born into the world.

The sugar planters of Louisiana bought their lands and paid for them; they ventured upon splendid improvements, leading the world in scientific agriculture, skillful mechanical engineering and good financiering. Our citizens of culture and capital sought the plantations, and the trade of the town was left in the hands of those content with it.

This great body of sugar planters climaxed in magnificence during the decade preceding the Civil War. The planters then dominated in the affairs of the state and were loth to engage in the war. With the Civil War came the cutting of the Mississippi's levees, the burning of the sugar houses, the destruction of the labor system, and the loss of all accumulated capital.

Four decades have passed since then, and they have wrought a wondrous change in the industry. For a generation before the civil war it had been the main support, directly or indirectly, of half the people of our state, and half of the accumulated capital of the state was utilized in it. With the cessation of the Civil War, active and earnest efforts were made to revive the Louisiana sugar industry. New men and new capital came into it, but its halcyon days were gone. All attempts at recovery were along the old lines, and for years but little progress was made. Most of the old, wealthy,

cultivated, ante-bellum families had some representatives left in the field, but many new people with no regard for family traditions, and with an eye to the almighty dollar alone, came to the front. The old plantations were in many cases sold out by the sheriff. The old families, some of whom were direct descendants of the French and Spanish nobility, were driven by poverty from their ancestral homes. Their places were taken by the country merchants, local capitalists, successful managers, by city capitalists operating through agents, and in this quiet, scarcely perceptible way, came about a change in our civilization that those who are only familiar with the new can hardly appreciate.

Individual families have fallen by the way; the ranks of the old *régime* have been practically dispersed, destroyed, but the sugar industry survives, and is to-day on a firmer footing than has been general in its history. The sugar planters of Louisiana in 1877 organized an association to secure and compile data concerning every phase of the industry. A few years later, in 1885, they organized the Louisiana Scientific Agricultural Association, which secured to the industry and to the state the services of that eminent scientist, Dr. W. C. Stubbs, and created the Louisiana Sugar Experiment Station. Under the leadership of Dr. Stubbs, with a competent corps of assistants, we have now made Louisiana the intellectually economic center of the cane sugar world. To aid in this, fifteen years ago our sugar planters created a sugar journal, *The Louisiana Planter*, to disseminate the data they were accumulating. This journal was made the organ of the Louisiana Sugar Planters' Association and of all the rest of our sugar organizations, and to-day circulates wherever sugar is made.

In this post-bellum revolution in our sugar industry, we have abandoned one of the striking features of the old industry. Formerly, with the enlargement of the sugar plantations, new houses were built at the remoter places. It was cheaper to build new sugar houses in the distant cane fields than to haul the cane itself long distances over dirt roads.

In 1870 portable tramways were introduced and gradually this led to the transportation of sugar cane in railway cars and to the developement of the great central factory system of these days. A producer of 100 tons of cane is today as sure of a market for his lot as is the larger producer of thousands of tons.

The sugar factory of to-day is a marvel of skillful creation. The highest grade of engineering ability has been utilized in its construction and the economy of fuel, of engineering supplies, and of human labor are all under constant study. The processes of the manufacture of iron and steel are no more closely studied than are those of sugar manufacture. In our fields, like progress has been made. With new implements, and learning why and how to use them, cane culture has been wonderfully cheapened. Fertilization is a matter of constant study and now the irrigation of our cane fields is pressing itself upon us. The economic side of our industry has burnt and is still burning itself into our memories and purposes and we are now all students.

RICE

S. A. KNAPP

About 1885 some optimistic farmers in Louisiana conceived the idea that improved agricultural machinery could be adjusted to the rice industry and rice husbandry could be modernized along all lines. It required some years of invention and experiment to adapt and adjust the monarchs of the wheat farms to an aquatic plant, but once accomplished, a new era dawned upon the Gulf states. If rice was to be cultivated by Oriental methods, the Occident must soon cease to produce it, for its labor was too expensive and intelligent to compete. The great reduction in ocean freights in the last half century and the more rapid transit added further peril to this industry. The possibility of using agricultural machinery in the rice fields changed the situation, and furnished the American farmer with the means for successful competition.

The present status of the rice industry in the United States is, from a productive stand-point, that the American farmer with high intelligence, complete mechanical devices, virgin lands and control of the best market in the world, is arrayed in the conflict of the industries against the ignorance of the masses, hand cultivation of the crop, semi-impoverished soils and markets that are held to the lowest point by the encroachments of poverty. While these are strong vantage grounds we should take nothing for granted, but carefully inquire, does the production of rice rest upon conditions that will compel its culture, or is the growing of rice now merely temporary direction given to industry, which some other product

will ultimately displace. Is there in the conditions here a legitimate place for the production of rice, and when produced will it meet any of the requirements of our people for better sustenance?

There are vast tracts of land along the Atlantic and Gulf coasts and in the interior that cannot be used for agricultural purposes without the thorough drainage and aeration of the soil. But this complete drainage is too expensive. Our people cannot afford to allow such large areas to remain unproductive. If perfect drainage is too expensive, the problem then is to find some plant that can prosper under existing conditions. Rice is one of the few cereals that can thrive in soils with some acidity and of excessive humidity. For this reason, if for no other, rice has become or will become an important factor in the agriculture of every nation which has territory situated in the southern temperate or in the torrid zones.

Under the systems of agriculture followed in the centuries that have elapsed, the upland soils devoted to the production of wheat, barley and oats, have gradually declined in fertility till in some countries, as in China, large tracts have been turned to commons. Not so with rice lands. For thousands of years they have yielded their annual crops and will doubtless furnish food for the nations in centuries to come. This has been credited to the inherent richness of the lands devoted to rice, to the lighter exhausting effects of the rice crop, and to the renovating character of shallow standing water all of which have some bearing. Water is a marvelous absorbent of volatile fertilizers, which to some extent impregnate the atmosphere in warm weather. These with such as arise from the cultivated lands of

the rice fields are retained by the water and restored to the soil for future use.

Another reason why nations must depend upon rice as one of its staples is the certainty of the crop. When density of population has created a demand equal to the usual product of the country's harvest, failure of the crop is a national disaster. In India or China even a partial loss imperils the lives of millions. Wheat, corn and barley may fail, and do fail occasionally with the change in seasons, but rice with a supply of fresh water always gladdens the farmer with the reward of toil. The large average resources of the American farmers and their wide diversity of products cause the partial loss of a single crop to be viewed with less dismay than among older nations, but the time is approaching when we shall need to husband all our resources and guard against disaster in the harvest.

The amount of food that can be produced per acre has an important bearing upon the selection of a standard crop. No crop responds more readily to good cultivation than rice, or more abundantly repays in the harvest all care bestowed. The coast region of our Gulf states does not take kindly to corn. With proper drainage to remove the acid from the soil, corn can be produced in remunerative quantities, but all things considered it is an expensive crop in the South. Wheat, oats and barley are winter crops and should follow rice. Rice is pre-ëminently the summer grain crop of the semi-tropical Gulf coast. Climate and soil are adapted to its production. It tends to diversify and balance the agricultural products in the great fiber producing states. The by-products from milling are among the most palatable and nutritious of stock foods, and the straw if prop-

erly utilized for the food of domestic animals or for paper pulp, is worth a sum per acre nearly equal to the cost of producing the crop. In the waste of the farm lies the fortune of the farmer.

As a human food it has been common for English-speaking people to pass it lightly with the remark that it is deficient in nitrogen or frame building material. Properly understood this is one of its excellencies, for most foods are unbalanced and it is easier to make a perfect nutritive ration by basing it on an unbalanced food, as rice, than upon a balanced food as wheat. When we add to the wheat, lean meat, pork, eggs, beans, or butter, we have deranged the ratio and constructed a combined food, uneconomical because out of proportion. With rice we can make a perfect ration by the addition of lean meat, eggs or legumes. Wheat bread can then be used at pleasure, because it does not materially alter the proportion. Rice furnishes a larger amount of energy than any of the other cereals with the least tax upon the system in digestion. The substitution of machinery for handicraft has lightened the labor of our people and reduced the hours of toil. The ability with the use of machinery, to produce an abundance allows the maturing family to live without hard labor. Life is less strenuous than half a century ago so far as it taxes muscular effort, requiring less food for frame repair and more food for potential energy. With these radical changes in what is required to properly nourish the body we have continued to select and consume our foods as if we were still at hard labor and thousands are suffering the penalties of violated law. The easily digested, energy imparting rice, if allowed to form an essential part of our diet, will correct many of the ills from which we

suffer. It is a common saying that in rice eating nations the people are smaller and possess less vigor than in those which largely have a diet of wheat, the inference being that the alleged physical inferiority is due to eating rice. It is true that some rice eating people are small and indolent, but in every instance it can be traced to other causes than rice. No people subsist on an exclusive diet of rice. The proper proportions of nitrogenous foods are almost invariably added. Insufficient quantity of food, the custom of sitting upon the limbs, thus impeding the circulation of the blood, and unsanitary conditions are responsible for any inferior physical development observed in Oriental nations. It is demonstrated that such of the rice eating Orientals as are abundantly fed are physically well developed, have superb health, great mental and physical vigor, and can endure more severe labor and for a longer and more continuous period than the hardiest races of the Occident. Wounds received by them heal as upon healthy animals. They defy malaria and are not subject to blood poisoning.

In our ignorance of rice we have fallen into three economic errors. 1st. Too rapid sale of the crop. 2d. Method of milling. 3d. Preparation of rice as a food.

1st. Rice as a food is improved by age. In India it is stored a year before it is sold to Europeans for consumption. For the use of the native population it is partially cooked before milling after which it undergoes a ripening process. In the United States it is rushed upon the markets direct from the thresher as if it were not necessary for the cereals to have time for a ripening process similar to the changes in fruits.

2d. Most of the essential oils and much of the protein of rice are stored on the surface of the kernel. The

removal of this brownish coating by friction gives a pearly whiteness and a luster to the kernel which captivate the eyes of the American house-wife, but this is secured at a loss of flavor and protein which renders it less appetizing, less digestible and decreases its frame repairing capacity.

3d. Except among the native population of the Carolinas and Georgia, and the creoles of Louisiana I have found in the United States no apparent knowledge of when to use and how to prepare rice for food. In the North it appears as a desert, in the West as lonely grains in a slop, in Louisiana it is a complete meal and a banquet. It is served on the tables of common people and in the banquet halls. There it is a staple food and not a luxury.

We are now prepared to discuss the economic production of rice under the new conditions and the probability of its becoming a staple food. A comparison of the number of days work necessary to produce an acre of rice in Japan, in India, in the Philippine Islands and in the United States conveys a vivid impression of the great value of machinery in the production of this cereal. That eminent authority on all economic questions, Sir George Watt, gives in detail the cost of producing rice in Bengal, by which it appears that it requires eighty days labor and the use of a yoke of oxen twenty-one days to produce, harvest and thresh an acre of rice. In Japan, the Imperial Agricultural College places the total labor on one acre at 120 days, without the aid of any domestic animals. In the Philippine Islands the cultivation of rice is almost identically upon the plan of India, except that the water buffalo is substituted for the ox, to the detriment of progress. Possibly not quite

so many days labor are bestowed upon the crop, but the yield is correspondingly less. The labor of one man eighty days and the use of a yoke of water buffaloes twenty days would represent the time and effort to produce an acre of rice. In the rice belt of Louisiana and Texas the labor of a man two days and the use of a team one and one-half days form the maximum expenditure of effort on one acre of rice. The equation of human labor then stands as forty and sixty to one in favor of the United States, and the principal factor producing this result is American farm machinery intelligently handled. Stated in terms of the product and omitting animal aid, in India eighty days of human labor in a rice field produce 1000 pounds of rice, in the Philippines 900 pounds, in Japan allowing for teams, 3000 pounds, and in Louisiana or Texas 64,800 pounds. Expressed in pounds, a day's labor in India produces 12½ pounds of paddy rice; in the Philippines, 11¼; in Japan, 37½; in United States, 810. This indicates that the American farm laborer produces nearly sixty-four times as much grain as his Oriental competitor and could be allowed $1.20 per day as a wage on the basis of two cents per day for the Indian farmer, assuming that the same price per pound is paid in both countries, which is far from true. The American farmer receives for his product nearly double the sum allowed the Indian ryot. Add to our better market the producing power of our virgin soil, and it would seem that our farmers stand upon a vantage ground from which no competition can displace them. This optimistic view is the result of canvassing conditions from one stand-point—productive power.

The moment rice leaves the farmer it undergoes a marvelous increment in price at the hands of every one

that touches it, the miller, the transportation lines, the broker, the wholesaler and the retailer, until the article that left the farmer as a staple food at moderate prices has by the time that it is offered to the consumer become a luxury too costly for the masses. The rice grains leave their humble birth-place on the Louisiana farms at the modest price of 2 to 3 cents per pound, but are offered to the consumer in most states at the prohibitive price of 8 to 12 cents per pound, a gain of 6 to 9 cents per pound from the producer to the consumer. Wheat, a product of Northern states, is milled, transported to Louisiana and sold to the consumer on a margin of ¾ of a cent to 1 cent per pound above the price paid the producer. It is thus observed that the farmers are thwarted in their efforts to popularize rice and place it upon the markets of the United States as a staple food by the exactions of commerce. But the battle of the industries is not at an end, and this with kindred difficulties will eventually be overcome by the wisdom and the energy of American farmers.

RICE—DISCUSSION

S. Locke Breaux: Let us consider, for a few moments some of the commercial phases of the cultivation and marketing of rice.

Granted the correctness of the statement that the culture of rice is adapted to our Gulf coast territory, and that so far its development as an agricultural product is caring for itself as rapidly as the process of assimilation can take place, and granted further that its value as a food product is beyond cavil, it brings us to the question of what we are going to do with the rice after we have made it.

The industry being an infant one, there is no question but that much just criticism can apply as to our present methods of trading. To the man from the West or the East who is accustomed to the handling of the stable grain crops of those sections, it seems that we are uselessly expensive in all that we do. Primarily, the manufacturing end of the industry is scattered over a wide range of territory, with the consequence that buyers are at sea, values are irregular, and taking our experience of this year as a criterion, parities are not maintained. It is much a case of each one for himself and the "devil take the hindermost."

Going a little below the surface, one of the principal reasons for this condition, in my opinion, is the system of toll milling. The different factories or mills look to the agriculturist to furnish them with their raw products in the operation of their plants, with the consequence that, not having direct monetary interest in the product, the principal idea of the miller is to run his

machinery so as to get the greatest possible output, when it is a fact that due to the lack of uniformity of grade, style, and character in rough rice, each lot, in order to produce the best result should be considered as to its individuality and handled accordingly. Under this system the best results do not always obtain in the manufacturing process of turning the rough into clean.

Then after the rice is ready for market, instead of the judgment of the manufacturer dictating when to sell, and how to sell, the constant pressure on the part of the owner of the goods wanting settlements and wanting money, means that the distribution is forced and influenced, not in accord with the markets or with the demands, but by the necessities and lack of judgment of the owner.

The remedy for this condition to my mind is simple. The manufacturing end of rice should do what the manufacturers of every other industry in the country do, and that is, buy their raw product and handle their output as their own goods, and this condition I believe will not be many years before coming to pass. A further advantage to accrue to the mills buying would be if, as the rice was purchased, it could be assorted out. Then the mill runs as to grade and style would have more uniformity, so that after business in a certain locality had been worked up there would be a greater certainty of supplying that trade with the goods to which it had become accustomed. I will illustrate this by calling attention to the manner in which the flour miller is enabled to advertise a certain brand and push it in a market and due to its uniformity get more money for it than he would by grinding up wheat into flour as it came to him instead of selecting it out.

I beg to say that my remarks must not be considered as being any adverse criticism of the manner and methods of any one branch of the industry, but I do believe that in the development of that industry we have got to get on the same basis as applies to, and as experience has shown to be the best basis in handling the grain stable crops of the country. It is true that New Orleans is the primary market for rice, the balance of the territory following her lead as to values, and just so long as the output is passing through her hands, just that long do we maintain prices and distribute the goods as the needs of buyers call for. This illustrates the necessity for the different mills through their clean rice men keeping in touch with each other, a difficult matter when the factories are scattered throughout a large territory, and each is trying to dispose of its product direct through its own clean rice man instead of pooling together and handling the common product through a single head located in some large center where the markets can be followed first hand, instead of through correspondence and telegrams.

I am of those who believe that the rice industry has come to stay, and that the future promises it will become one of the staple crops of the Gulf coast territory. It will not be very long before rice gets to be a staple in these United States as are our wheat and corn.

I will only touch upon the good work being accomplished by the Rice Association of America which represents the only concerted effort being made toward the increased consumption of rice, and the establishment of a rice kitchen at the St. Louis World's Fair will, I believe, accomplish much toward that end.

COTTON AND THE GENERAL AGRICULTURAL OUTLOOK

D. F. HOUSTON

I shall not waste the time of this body in emphasizing the importance of cotton as a commodity or in discussing the unique position which it holds. It is one of the commodities which has a world-wide demand. Its production, however, is confined, for the most part, to a particular section of one of the countries of the world. Up to within the last year or two little or no apprehension was felt as to the possibility of a practically indefinite increase in its production. Conditions had been such as to justify the expectation that the South alone would be able to meet the world's demands for a long time to come. The increase in the quantity of this product from the beginning of the 19th century to the beginning of the 20th century, with the exception of the period from 1860 to 1875, had been rapid and steady, particularly so after 1850 when the southwestern trans-Mississippi territory was opened up.

Within the newer and more fertile territory, from which the largest increase was expected, there has appeared a destructive cotton insect, the Mexican boll weevil, which constitutes the greatest menace to cotton production that the cotton farmer has had to face. And it so happens that within the short time in which this pest has been most active, unfavorable climatic conditions have prevailed over the entire South, resulting in a marked lessening of the yield in most sections. It is not remarkable, therefore, that much apprehension has

been felt throughout the world that there may be a permanent decrease in the supply of cotton, and that startling developments have presented themselves on the cotton exchanges. A careful discussion of the situation is, therefore, especially opportune.

Let us consider first the Mexican boll weevil as a factor in the production of cotton. This insect has been known to scientists for more than a generation. It was first described by a German naturalist in 1878. It is probably a native of Mexico or of Central America. It made its appearance in Texas in 1892–93, near Brownsville. Since that time it has spread rapidly, moving at the rate of forty or fifty miles a year without materially lessening its numbers over the territory as it advanced. By 1895, it had advanced as far north as a line drawn from San Antonio to Columbia, near the mouth of the Brazos river; by 1898, to the neighborhood of Navasota and Bryan; by 1901, to Waco and Palestine; and by 1903, to the neighborhood of Brownwood on the west, Sherman on the north, and beyond Nacogdoches on the east; or on the west well on towards the ranch section, on the north nearly to the Red River, and on the east to within a short distance of the Louisiana line, covering more than 5,000,000 acres of the 7,000,000 planted in cotton, affecting a region which, in 1899, produced more than 2,000,000 out of a total production in the state of 2,600,000 bales.

The rate of increase of the insect is remarkably rapid. Each female lays from 50 to 150 eggs during the course of a month or six weeks. It lives a month or more, and it is estimated that each insect will destroy two or three squares a day. Its habits are such as to render it proof against any means yet devised for its destruction. It

feeds on nothing but cotton, and entrenches itself in the squares or in the bolls where it is protected against chemicals or poisons, and from which it can be taken only with considerable difficulty. During the winter it hides in the crevices of the ground, or under bark, pieces of wood, or trash of any kind. That it can not be destroyed by any human device is practically conceded by all the entomologists. In the next few years it will certainly cover every section of Texas; and that it will spread over the cotton area of Oklahoma, Indian Territory, Arkansas, Louisiana, and ultimately over the entire South, is fully expected.

While people in their panic have probably attributed to this insect damage which has been done by other insects such as the boll worm, by diseases such as the root-rot, and by unfavorable climatic conditions, still there is ground for believing that in one year alone it has destroyed 240,000 or 300,000 bales with a value of $12,000,000 to $15,000,000. In seven counties running from west to east, selected from the area in which the insect appeared before 1895, the production between 1899 and 1902, decreased from 98,225 bales to 88,967 bales; in seven counties in the area in which it appeared between 1895 and 1898, the production decreased, between 1899 and 1902, from 247,579 to 129,817 bales; and in seven counties in which it appeared between 1898 and 1901 there was a decrease, between 1899 and 1902, from 279,935 to 180,071 bales. In the area in which it appeared between 1901 and 1903, the damage was not so great and there was an actual increase of production between the dates mentioned. But it is undoubtedly true that in the year 1903, over this area, the destruction has been enormous. On the

other hand, in seven counties, running from west to east, selected from the area not yet affected by the boll weevil, the production increased, between 1899 and 1902, from 151,000 to 175,000 bales, while in a second set of seven counties, likewise selected from the non-boll weevil area, the production increased, in the same period, from 197,000 to 265,000 bales. The difference between the yield in the boll weevil section and in the non-boll weevil section is too great to be explained by differences in climatic conditions. For the most part, these were substantially the same over the entire state.

Everywhere men are asking what the outcome will be. Will cotton production be discontinued in a vast and fertile territory from which the largest increases have been obtained in the last few decades, and from which the largest increases have, until recently been expected? The answer given to this question by all of the experts, and by the greater number of intelligent, practical farmers is in the negative. The prevailing opinion in Texas is that while it is probably useless to attempt to exterminate the boll weevil, a profitable crop can be raised in spite of it by the employment of approved methods of cultivation. It has been demonstrated by experiments carried on by experts of the federal Department of Agriculture and at the Agricultural and Mechanical College of Texas, that by careful preparation of the soil, by early planting, by using seeds of early maturing varieties, by keeping the fields scrupulously clean, and by persistent and late cultivation; in short, by using methods which a farmer should use, and which are not much more expensive than those that ought to be employed were the weevil not present,—cotton can continue to be raised with a profit. The

effect of such methods, it is claimed, will be to make the cotton mature before the boll weevil becomes active. It has been discovered that it does not begin to do damage on a large scale until the latter part of July or the first of August, its early or late advent and activity depending, in considerable measure, on whether there is much rain fall or general atmospheric moisture.

But still there is room for a considerable amount of pessimism. Farmers are conservative; most of them possess comparatively little initiative, and vast numbers of them find it difficult to secure the requisite equipment in the way of seed, machinery, stock, and the labor necessary to make intensive cultivation possible. The situation calls for a campaign of education by every agency that can be employed, and even then progress will be slower than many people expect. It is probable that in time each farmer will, in planting cotton, limit himself to an area which he can cultivate with scrupulous care, and that those farmers who cannot muster up the intelligence and initiative will be crowded to the wall and will be compelled to direct their attention to other crops and to live stock, with immense gain to themselves and to their communities.

Turning for a moment to the production of cotton in the South as a whole, outside of the boll weevil area, and eliminating the boll weevil from consideration, there is no reason whatever for apprehending difficulty in securing, under normal conditions, a large increase in cotton production. In each state there are still tracts of land not devoted to any crops which can be put into cotton, and it may be said with some assurance that there is scarcely a farm in the South on which more cotton cannot be raised by the employment of better methods of

cultivation. Reasons that have been assigned for the decrease in the cotton crop since 1900, such as the deterioration of seed, the migration of some farm labor to the cities, and the tenancy system may be dismissed without serious consideration. It is undoubtedly true that exceedingly careful attention should be given to the selection of seed and to cotton breeding, and that everything that can be done should be done to retain on the farm the more intelligent labor and to increase the efficiency of tenants. But it cannot be safely argued that there is anything in this direction which goes to explain the decrease in the crop since 1900. There is good reason for thinking that there has been an improvement in the cotton seed used by vast numbers of farmers. It is undoubtedly true that the agricultural population in many sections of the South has not only absolutely but also relatively increased. The statistics of the federal census show that white cash tenancy farming and black share tenancy farming give a larger yield per acre than ownership farming by either whites or blacks, and that negro cash tenancy farming and white share tenancy farming are only slightly less productive than white ownership farming, and are more productive than black ownership farming. The explanation of this probably lies in the fact that those who own, and supply tenants, are more intelligent, furnish more efficient machinery, and give more efficient direction to the labor than can the average owner. And the superiority in point of production of the negro share tenant over the white share tenant is probably due to his greater readiness to receive and carry out directions. The census of 1890 gives the following yields per acre for each class of farmer, white and black.

White: owner 0.398, cash tenant 0.403, share tenant 0.380. Black: owner 0.364, cash tenant 0.381, share tenant 0.400.

Passing to the second and more general part of my topic, the general agricultural outlook, I shall endeavor, by reference to recent developments, to suggest the agricultural tendencies and probabilities.

Speaking summarily, the South has, in recent years, made great advances which will become more marked as time passes. In the production of the old staple crops, it has made remarkable progress. The improvements in the methods of production and in farm equipment have been no less striking than the increase in the yields of the various crops. New and very fertile land has been appropriated, and land already under cultivation, has been more satisfactorily tilled. In 1860 the total number of bushels of corn produced in the Southern states under discussion, was less than 230,000,000, and it did not exceed this figure until 1890, when it reached 272,000,000, while within the next ten years it amounted to more than 378,000,000. The total tonnage of all forage crops produced in 1859 was less than 930,000, and it was not until after 1880 that the production again reached this point, while in 1899 the yield exceeded 3,200,000 tons. The total value of all live stock, reported in the census of 1860, was approximately $331,000,000, which figure was not reached again until about 1890, while the census of 1900 reported a total valuation of approximately $525,000,000. The foregoing figures sufficiently suggest progress along old lines.

The main advances along new lines have shown themselves in truck and fruit farming. Time will not suffice to enter into details in this direction, but the statis-

tics for Irish potatoes, which may be taken as an index of the truck crops for the South, of local market garden products, and of the principal fruit trees, will be representative. In 1859 there was a total production of Irish potatoes of 5,460,000 bushels, a figure which was not exceeded until after 1880, while in 1899 the production exceeded 12,000,000 bushels. The statistics for local market garden products are still more striking. They do not extend back beyond the XIth census. That census reported products with a total value of $3,775,000, while the census of 1900 reported products with a valuation exceeding $18,000,000. The development of the fruit growing interest has been no less rapid. The census of 1890 reported more than 33,500,000 apple, peach, pear, and plum trees, while that of 1900 reported approximately 67,500,000.

Interesting tendencies are revealed by the statistics of the number and acreage of farms, and of the value of farm implements, machinery and farm products. The number of farms has increased enormously, while the size of the farm has diminished steadily, and the value of farm implements and machinery has, in the last decade made a gratifying advance. The number of farms which, in 1860, was less than a half million, in 1900 was only a little less than 2,000,000 and the average size of the farm, which in 1860 exceeded 410 acres, in 1900 was approximately only 125 acres. In 1860 the value of farm implements and machinery was returned at $75,000,000, which point was not reached again until in 1890, while in 1900 the total valuation exceeded $122,000,000. All this contributed to the increase in the total value of farm products from $412,500,000 in 1870 to more than $952,500,000 in 1900.

It will be observed, speaking generally, that the South did not recover from the Civil War and the disruption of its social and economic system until about 1890. When we remember that the South, for the first time in her history, attained a normal industrial position about 1890, and that she has had only a little more than a decade under which to secure expansion under normal conditions, we are amazed at the vast results secured. The future will be a continuation of the recent past on a large and intense scale. We shall witness a remarkable growth of better farming, a large increase in modern equipment and machinery, satisfactory improvements and a rapid diversification in the staple crops and a tremendous uplifting in the intelligence and prosperity of the people.

COTTON AND THE GENERAL AGRICULTURAL OUTLOOK—DISCUSSION

GEORGE K. HOLMES: The makeshift agricultural system that forced itself upon cotton planters after the Civil War, although a necessity at that time, had various features that grew to be real burdens upon the planters, and the system was too uneconomical to last. Among these burdens were the tenant system, the crop lien, the enforced sale of cotton by the planters as soon as ginned, the want of rotation and diversification of crops, and a too large reliance upon commercial fertilizers. Under this system the planters' purchases and sales become mere transactions in barter, in which cotton was exchanged for supplies for farm and family. It is this barter, in which bookkeeping takes the place of money, that has made money so scarce among Southern agriculturists, for money does not go where it is not used.

The negro has been, and, in a less degree, still is essential to Southern agriculture, but he has dominated the character of agriculture, to its disadvantage. Ex-Governor Northen of Georgia said, in a recent address: "We have not diversified our crops, because the negro has not been willing to diversify. We have not used improved machinery on our farms, thereby economizing expenses, because the negro is not willing to use such implements. We have not improved our soil because the negro is not willing to grow crops to be incorporated into the lands, nor leave his cotton seed to be returned to the fields that he has denuded of humus and all possible traces of fertility. Because he is unwilling to handle heavy plows, we have permitted him to scratch the land with his scooter just deep enough to allow all

the soil to be washed from the surface, leaving our fields practically barren and wasted. We have not raised stock on the farm because the negro is cruelly inhuman and starves the work animals we put into his hands for his personal support. We have accepted his thriftless and destructive methods simply because under our present system we have not been able to help ourselves. If this be true, our present system in this relation is absolutely ruinous and it will not invite the residence of intelligent settlers from the outside."

With hardly an exception, the Southern farmers whose letters I have read testify that the deterioration of negro labor has become so accelerated as to be almost perceptible year by year. The old economic deduction that free labor is more efficient than slave labor is a gigantic fallacy as far as experience in the South is concerned.

Within the last few years, the negro has evidenced a marked tendency to migrate from the plantation to town and city; to railroad, mill, and lumbering camp; and to diffuse himself throughout the North. The reason for this is that the plantation negro has so deteriorated for the practical purposes of getting a living that he is finding the conditions on the upland too severe for him, and so is migrating to places where conditions are easier. In Virginia he has very largely disappeared from the farm outside of the southeastern part of the state. In consequence of this, the average cultivated farm area is limited to what can be cultivated by one family with a little extra help, just as it is in the North, and for the same reason. The migrations of agricultural negroes to the cities and to the North have gradually forced the line of small cultivation southward through Virginia to North Carolina.

White labor is supplementing negro labor in the raising of cotton with an increasing fraction. From census statistics it is estimated that approximately 40 per cent of the cotton field labor is white, and that in Texas it is fully 60 per cent. When the old Southern cotton plantation loses the negro, it will then be face to face with problems of far reaching consequences. Forces which I have not time to discuss seem to be at work to diminish the reliance of the cotton planter and Southern farmer upon negro labor. This will jeopardize the present tenant system, threaten the disruption of the large plantations, and increase the rotation and diversification of crops. The Southwest has received white labor from the outside because of its new and cheap land, but the old South will have its day in the influx of white labor, because the time is at hand when it should be seen that the cheapest agricultural land in this country is the old exhausted land of the South, with its low prices and enormous possibilities under intelligent management in the utilization of green manures, the rotation of crops, the diversification of production and wise specialization.

Railroads can help the agricultural South immensely, if they will; some of them have done so. Conspicuous examples have been set by railroads running from the Southwest to St. Louis and Chicago, and by the railroads running up the Mississippi Valley and the Atlantic coast; but among the smaller railroads and branches of the larger ones are many that so adjust their freight rates that they bring goods to the farmer, but market few products for him. Many an agricultural community in the South suffers under and because of this condition. The complaint is that freight rates for the transportation of hardly more than a score of miles

are so high that they absorb perhaps the entire selling price of farm products. A railroad that sets out to make business for itself, such as the Southern Pacific, is an everlasting example to these unprogessive railroads. I understand that through the efforts of the industrial agents of that road 70,000 families have immigrated within the past ten years to the region along its line, largely to southeastern Texas and southwestern Louisiana. Some of our states have less than this number of families. A remarkable fact in connection with this immigration is that these families come mostly from the North—from such states as Illinois and Indiana.

The cotton planter and the general farmer in the South have been in purgatory, but they are coming out. The agricultural development of the South since the census of 1890 is very marked and this in spite of a comparison with the tremendous agricultural development of the North Central states. The South, which had been backward in its corn production for many years preceding 1890, finds itself since that time with its fraction of the national production of corn increasing faster than that of any other section. The same is true with regard to wheat, sweet potatoes, cane and sorghum syrup ; and to these may be added tobacco, farm-made butter, horses, mules and swine. The South occupies a second place in the rate of increase of production in comparison with other sections, in buckwheat, hay, apple and peach trees, cattle other than milch cows, and farm-made cheese. Of course, if rates of progress for the different states were examined, it would be found that the rate of progressive production in the South is considerably localized, more particularly in the southwest than elsewhere ; but the older part of the South is

by no means out of the race, although it has no virgin soil to exploit. The South is making great progress, too, in enriching the soil by means of leguminous crops, such as cowpeas, thereby supplying nitrogen and humus and breaking away from the sole dependence upon commercial fertilizers. Notwithstanding the persistence of cotton as the one crop of the plantation, agriculture is diversifying in the South in the direction of fruits and vegetables, live stock, dairying, tobacco, rice, and cane and sorghum syrup.

Evidences of a new life in agriculture appear in numerous places. A dozen years ago, Southern farmers made their first noticeable attempt to produce their own supplies, and since that time progress has been made in this direction to an extent sufficient to be evident in the census of 1900. A large independence in this respect was enjoyed by plantations half a century ago; they are now returning in a measure to that independence. There is no part of this country where the farmer can become so independent as he can in the South—independent in the production of that numerous class of products comprehended within farm and family supplies.

A word in conclusion in regard to the future of cotton. The plans of British, French and German cotton manufacturers to have cotton raised in Africa and perhaps South America in quantities sufficient to become a large export crop, seem plausible enough if we ignore one essential factor. The conditions of climate and soil are ideal and cotton grows perhaps spontaneously in the regions toward which their attention is directed, but they have overlooked the necessity for men who will engage in arduous and continuous labor. The reliance upon labor in Africa must be upon native negro labor, and how

slender this reliance is for such an undertaking as cotton raising, should be apparent to any one who has read the numerous accounts of white men who have come in contact with it. The Transvaal Labor Commission, appointed to examine a critical state of affairs on account of the scarcity of labor, has just reported that the demand for native labor for agriculture in the Transvaal is largely in excess of the present supply and that there is no adequate supply of labor either in southern or central Africa to meet the requirements of agriculture, mining, and the various industries in that colony. A plan to place the negroes under a system of peonage has been earnestly advocated within a year in South Africa and England. Cotton could be produced in large quantities in Brazil if labor were at hand for the purpose, but in that desert of laziness the production of surplus cotton is out of the question, although all other requirements are present and ideal. It need not be expected that Egypt and India will increase their production of cotton faster than is necessary to maintain their present relative position in the world's supply. Their labor has been on trial in this direction long enough to demonstrate what it can not do.

On the other hand, the cotton belt of this country has by no means reached its limit of production. Under a rotation of crops, leguminous manures, and an improvement of seed, the present cotton crop of this country can be doubled upon the present number of planted acres. If the boll weevil does not prevent, the South will continue to supply more than two-thirds of the world's cotton, and the welfare of the cotton producer demands that the prices shall be high.

THOMAS N. CARVER: Does the rotation of crops check the boll weevil?

D. F. HOUSTON: The only thing I know of is to stop

planting cotton. I have here some specimens. I doubt if stopping the planting of cotton for four or five years would stop the boll weevil.

WILLIAM C. STUBBS: I beg to say a few words about the boll weevil. It can live only on the cotton plant. If you destroy the cotton plant you will destroy this pest. The question will be considered at a meeting to be held in New Orleans some time during the winter. A bill is to be introduced in Washington, and we are going to fight the weevil heartily. We are going to fight it on the lines of the railroads and streams, to keep it out of Louisiana. We have the assertion of Prof. Wilson that the treasury of the United States is the best money chest in the world, and yet if a man had all of that money there would not be enough to fight the boll weevil. We will try to hold him in check.

The insect is not a new thing. During our southern war, Cuba tried to raise cotton, yet there were two or three wild cotton plants producing boll weevils as fast as it was raised. That effort was a failure. Since then it has been introduced all over the parishes where cotton is raised. The boll weevil is all over Mexico, except in a single state which is quarantined by a hundred miles of non-cotton country.

We have to fight to keep it from spreading. Texas has special commissions. One of the speakers said that 60 per cent of the cotton growers are white men, while in Louisiana 60 per cent are negroes. We have all the facilities in the world for flooding the state. I can go from here to fifty-five parishes by water. But we don't want to run the risk of flooding him out of Louisiana. I believe this to be the most serious danger that ever confronted the cotton industry. If it is permitted to ravage our state our cotton industry will be reduced to 8,000,000 bales.

TOBACCO

LAWSON H. SHELFER

The subject "Tobacco" is of great importance to the agricultural people of the United States. While tobacco is not a necessity, humanity has taken to the use of it as a luxury, and it is needless to say that from the crowned heads of the highest nations to the lowliest of our humanity the use and relish of this luxury in its various forms is almost universal. There are millions of dollars spent annually for this luxury and while the weed grows in the tropics, semi-tropics and even in the torrid zones, still there are only special places that grow a special tobacco. There are three important features to tobacco culture, the first being soil that is adapted to the special weed, second, climate, and third, experience in handling.

SOIL

The most important part of tobacco culture is the soil. While the plant will grow luxuriantly on any soil where vegetables will grow, still the soil gives the leaf its quality and flavor, so a special soil is needed for every kind or variety of the tobacco leaf. In the chewing tobacco section of the United States is a large area that grows this variety, still there is only a small amount of the soil that will produce a quality of high commercial value. Sometimes the soil can be stimulated with a fertilizer that will greatly improve the quality and at the same time it will only improve the quality on the soil most adaptable for the special plant. You can take a soil that is adaptable to a special variety of tobacco and that will grow a fine leaf of a high commercial

value and in a stone's throw will be a soil that will produce a leaf nearly worthless. Take an old tobacco section, such as Cuba, where the highest grade cigar tobaccos is produced, and you will find that it can grow a high grade only on a small section. Here and there, sometimes in a little narrow strip, while the adjoining lands produce a luxuriant plant of tobacco which is worthless to the trade. This applies to all of the cigar tobacco sections of the world. Florida, Connecticut, Ohio, Pennsylvania, Wisconsin, Texas, and in all the states that produce a cigar leaf, you will find the same conditions, the choice soil in every section where the cigar leaf is produced being very limited. In the same way you will find the chewing tobacco, smoking, cigarette and snuff varieties have a special locality or a special soil that will bring the highest prices, so there is no hesitation in stating that the soil is the foundation of the cultivation of tobacco of any variety. This also applies to almost any class of agricultural products. The agricultural people of the United States to-day do not devote enough time to classifying the soil and to planting the crop that is best adapted to it. That is why the United States Department of Agriculture, through the Bureau of Soils, has devoted so much time during the past few years to the analysis and classification of the soils of different sections, and to-day the most essential point to take from an agricultural view, is to have your soil analyzed and see if you can supply by chemicals what is needed for the agricultural crop that you may want to grow.

CLIMATE

The climate has a great deal to do in itself and it takes different climatic conditions to raise different crops

successfully. Tobacco will grow in almost any climate from almost any seeds, wherever any vegetation will grow. It does best in the tropical or semi-tropical climates, and the highest valued tobacco from a commercial standpoint is produced in such climates. Still valuable tobacco can be grown further North than any grain crops. Climate and soil make the different varieties of tobaccos. For instance, you can take seed of a pure variety from the choice section of Cuba and the same from the island of Sumatra, and then from any state in the Union and plant them all in Texas or in any other locality, and they will eventually run into one variety which is most adaptable for that climate and soil. If the climatic condition was all that was necessary the entire island of Cuba would produce the famous Vuelta Abaja tobacco, or the entire island of Sumatra would produce the famous Delhi Sumatra wrapper, or the entire state of Virginia would grow the high-priced chewing tobacco wrapper, and the same would be true of any other state with respect to its most famous variety. So it is plain to say that the climatic conditions go with the soil.

While dwelling on this point it will be well to point a word of warning to the tobacco growers of the United States; that is, if you are growing a special variety of tobacco. Either cigar filler, wrapper, chewing tobacco (wrapper or filler) snuff or cigarette tobacco grow from the highest grade seed from the section that is most adaptable to the variety that your soil and climate is suited to. Take the cigar tobacco, with which I am more familiar than any other. We want our filler tobaccos of the Southern states or the semi-tropical climate raised from seed from the Vuelta Abaja district of Cuba, for the reason that there is where the

world's highest grade filler tobaccos for cigar purposes is raised. Wrapper tobaccos can be grown in this climate from the same seed that is used for filler as it is in Cuba. Still there is a great deal of our soil more adapted to raising a high grade wrapper from the Sumatra seed, which should come from the Delhi district of Sumatra. If you are going to raise a high grade of chewing tobacco, go to the section of Kentucky, Virginia or North Carolina that grows the best commercial tobacco and get your seed there. The same applies to any tobaccos of any of our states. We can raise a thinner fiber of wrapper leaf of the various grades by erecting a lattice frame and by covering it with cheese cloth, or coarse gauze for shade. This will hold moisture near the surface and regulate the temperature so as to give a more rapid growth and thinner fibered plant. This is desirable only for the various varieties used for wrapper purposes.

HANDLING

Handling is the third and one of the most important of all points to remember. You can take soil, climate and seed, and without skill you will make a failure; or you take either of the three above mentioned points—soil, climate, or skill—and without all three combined, the whole is a failure. The cultivation of tobacco of various kinds, in various sections, is very simple to any man who is familiar with any branch of agriculture. Still, there is a great deal of science, even in growing plants, transplanting and cultivation. But any practical farmer who can grow a grain or vegetable crop of any kind, can produce tobacco to this stage. When the time comes for topping the plant, it is necessary to have a practical man to understand just exactly the number

of leaves to top, and know what soil and climate will mature perfectly. This applies to all varieties of tobacco and to all sections. In other words, it is necessary to gain some experience from the local growers of any section which produces a high type of tobacco that is adaptable to their section.

As to the ripening and harvesting of the plant, it is also very necessary to have a person who has a practical knowledge of the local plant of his section or of the climatic conditions of the country.

After the tobacco is harvested, the burden is not entirely over. It takes experience of handling the different varieties in the different sections so as to get the best results. This is why the Department of Agriculture of the United States is spending so much time and money in experimenting to obtain the best methods of preparing for the market every variety in every section.

COMMERCIAL VALUES OF DIFFERENT TOBACCOS

The United States today, while producing enormous amounts of tobaccos of various kinds and used for different purposes, imports from Cuba filler tobaccos for which we pay the Cuban agriculturist about eight million dollars per annum. The import duty on this tobacco being five or six million dollars, making a total of about fourteen million dollars for filler tobacco, which could be produced in Texas, Florida, or where there are similar soils and similar climates. This would mean more to the agricultural people of the state of Texas than the revenue derived from almost any other crop. The soils and climatic conditions of Texas will produce this filler tobacco. Notwithstanding that we compete only with the filler tobaccos of the island of Cuba, we

compete with the wrapper of Sumatra. This latter amounts to millions for the importation, while we have soils where we can apply the skillful methods of our advanced American people, and by using the above mentioned methods of artificialing by shade, we can give this amount to our American agriculturists.

Notwithstanding that there are a great many cigars imported in their manufactured state from Cuba, Mexico and other countries, we American farmers can compete and hold our own by paying strict attention to, and by studying out the conditions, the needs, and wants of our American people.

TOBACCO—DISCUSSION

J. B. KILLEBREW: Tobacco belongs to the nightshade family, which furnishes the potato, the tomato and red pepper, all of American origin. There are four species in America belonging to the genus Nicotiana, two of which, N. tabacum and N. rustica are extensively cultivated, and the N. quadrivalvis to some extent by the Indians in the Northwest. To the former species all the numerous varieties of tobacco now grown in the United States and Cuba may be referred; to the second, N. rustica, belong the Turkish and Hungarian tobaccos, and probably the Latakia tobacco of Syria. The Shirez tobacco (N. Persica) is said to be a native of Persia, and possibly it is the same species that is grown in China. In flavor it resembles the Latakia, but not in its habits of growth. Some of the varieties may have descended from one species or several, inextricably mixed by crossings and variations. In no other plant is the variability of the species involved in a labyrinth of greater difficulty and manifests itself in so many ways. Soil, climate, situation, reciprocal crossings of varieties and interbreeding, all go to produce an offspring, varying in size, structure, delicacy of fibre, fragrance, porosity, color of leaf, and capacity or incapacity to secrete resinous or gummy substances. Kolreuter, quoted by Darwin in his work on "Variation in Plants and Animals under Domestication," speaks of five varieties of common tobacco that were reciprocally crossed, and they bred plants intermediate in character and as fertile as their parents. When these five varieties were crossed with a different species, with a single exception they yielded sterile hybrids.

Tobacco, like wheat, adapts itself to climate, soils and situations. In New England, Pennsylvania and Wisconsin, tobacco is ready for the harvest within eight weeks from the time of transplanting to the fields, but in Virginia, Kentucky, Tennessee and North Carolina, from 110 to 140 days are required to ripen the leaves, except in the Champlain districts.

The Havana seed tobacco is now grown extensively in all the localities in the Northern states where twenty-five years ago only seed leaf varieties were cultivated. This Havana seed is the result of four successive generations from the original parent seed of the Havana variety. The modification brought about by climate and soil gives a distinct variety, longer in leaf, but with diminished fragrance, as compared with the original Havana. The leaves are finer in texture and more fragrant than the seed leaf varieties. If the seed from the Havana seed variety be planted in succession for several years, the tendency of the plant is towards the larger and coarser inordorous seed leaf. In this, one may see the effects of climate and soil in producing variations in species. Flavor is due to climate ; texture and color to soil.

The most striking illustration of the variability of species produced by soil is that of the yellow tobacco in Virginia, North and South Carolina. In 1852, two brothers living on a sandy ridge between two affluents of the Dan River, in Caswell County, North Carolina, planted a crop of tobacco. The soil was thin and sandy and almost destitute of any plant nutrition. It was light in color, very sandy in character but friable and highly porous. The tobacco plants set out on this soil were grown in seed beds, sown with varieties that had produced heavy dark types. After being transplanted

they grew very slowly. As the leaves developed and expanded it was seen that they changed in color from a light green to a golden yellow. In this condition, the plants were harvested and cured with open charcoal fires in closely chinked log barns. The leaves retained all their rich golden or lemon hues after being cured and they developed an aroma of a honey-like sweetness. When the tobacco was carried to market it brought a fancy price. The manufacturers of tobacco in the North, after that event, soon learned of the fitness of this yellow tobacco for making the best plug and it sprang into active demand. With this demand, came increased acreage and it was soon ascertained that all whitish or yellowish sandy soils in the Piedmont region would grow this handsome type of tobacco. The production soon extended into Person, Granville and Rockingham counties in North Carolina, and Pittsylvania and Halifax counties in Virginia. It was then carried to Buncombe and other counties in the mountainous division of North Carolina.

After 1880 its cultivation in a tentative way was begun in the Champlain districts of North Carolina with remarkable success. It was grown on the Potsdam sandstone soils and granitoid soils of eastern Tennessee, and in South Carolina. Wherever the conditions of sterility prevailed in a soil with a whitish color, there yellow tobacco could be grown successfully. Any ferruginous matter whatever in the soil is fatal in the production of this type. Portions of the same field, where trap-dykes were found with a residuary red soil, were carefully shunned by the growers of yellow tobacco.

The theory in growing the best types of yellow tobacco is that the soil is a sponge, which must have the capacity to receive and retain just enough fertilizing

matter to support the plant until it reaches a proper size. After this it is best that the fertilizers be exhausted so that the plant may go into a gradual decline in its vitality, like the hickory leaves in autumn, growing more and more yellow, more and more delicate in tissue, more and more beautiful and storing up more and more sweetness until it is harvested. It was soon ascertained that too much manure applied to the soil would destroy the best qualities of the leaf, vitiate its fragrance and diminish its brightness of color.

The stupendous economical effects of the growth of yellow tobacco in North Carolina are well worth our attention. The prices of old worn out lands, once perfect pictures of sterility, desolation and unfruitfulness, have advanced from fifty cents per acre, thirty years ago, to thirty and fifty dollars per acre at the present time. Oftentimes from $150 to $300 are made from a single acre of tobacco. Great centers of trade have sprung up, new lines of railroad built, and the manufacturing industry has advanced more rapidly in North Carolina than in any other southern state. The profits from the yellow tobacco crop laid the foundation for the building of a large majority of the 7000 manufacturing establishments now in North Carolina, of which 679 are for textiles and 101 for the manufacture of tobacco.

Another remarkable variation of species, due both to soil and climate, is the White Burley variety, which, in its results, has changed the whole character of the agriculture of central Kentucky, converting a large portion of the finest blue grass and stock-breeding districts in America into a tobacco region. At first the plants grow slowly, but after becoming well established they advance rapidly, attaining magnificent size and displaying great vigor. They ripen two weeks earlier than most

plants. When cured by atmospheric influences the underside of the leaf has a whitish tinge and the upper surface has a beautiful reddish golden color. Its culture has extended into all the rich counties of central Kentucky, as well as into those of southern Ohio. The soil best suited to its growth is a blue grass soil, gray in color, rich in humus, the residuum of the disintegrated Trenton limestones.

The variety has proved to be a most profitable one, with two sub-types; the heavy used for manufacturing plug, and the light for a cutting leaf. Both types are very popular with manufacturers, because of their absorptive capacity. The White Burley tobacco is low in nicotine having a content of about 2.80 per cent. while the rich heavy shipping types have a content as high as 5.60 to 6 per cent. This low content of nicotine made the White Burley tobacco exceedingly popular with American consumers because of its mildness and its less injurious effects upon highly organized nervous constitutions. Yellow tobacco carries a still smaller per cent of nicotine, but with less absorptive capacity. Three-fourths of the chewing tobacco, both plug and fine-cut, consumed in America is manufactured from the White Burley and the yellow tobacco types. The White Burley is now a distinct variety, as much so as the seed leaf, and is what Darwin calls an incipient species, as also is the yellow tobacco.

There is a well-defined correlation between the color of the soil and the color of the tobacco grown upon it and also between the constituent elements of the soil and the quality of the cured product. It has been mentioned how the pale yellowish soils grow a tobacco of a yellow color; how the grayish soils of the blue grass region will effect the color of the White Burley. This

latter type planted on red soils will show more brown or red in the cured leaves. The rich, dark, heavy shipping tobacco is grown on reddish or chocolate colored soils, clayey in composition, compact and heavy. The color of these soils is due to the presence of iron oxides. The more heavily manured such soils are, the darker and stronger the tobacco. This dark tobacco is the richest of all types in nicotine, gummy substances and oils. It is heavy of leaf, with small midribs and delicate fibres.

The leaf is soft, pliant, oily and silky, resembling to the touch a kid glove. Its pores are filled with gummy substances to such an extent as to impair its absorptive capacity. While the co-efficient of absorption for the White Burley types is 2.60, that of the heavy tobacco is only 1.48; that is to say the White Burley will absorb about twice as much water or sauces with which it is treated in its manufacture as the rich, heavy shipping tobacco.

A light colored soil, whether of arenaceous or clayey material, will yield a product that will cure to lighter colors than that grown on soils of a darker color. Tobacco grown on sandy soils is more porous but is much coarser than that grown on clayey soils. Newly opened land, or what is called in the South "new ground," whatever its character will mature a crop of tobacco quicker than old lands of the same general characteristics and the product will be lighter in color.

Perique tobacco, so strong in the essential elements of tobacco, is almost black in color. It is grown in the vacheries of Louisiana, the soils of which are a dark alluvium, rich in humus and plant food. These vacheries are but little elevated above the swamps with which they are surrounded. The dark color of the tobacco is due largely to the method of curing, which is done by

the frequent reabsorption of its juices after being heavily pressed. Indeed it is said to be cured in its juices.

Situation has much to do with the quality of cured tobacco, other things being equal. A southern exposure will make a tobacco lighter in body, brighter in color and with less gummy material in its composition. A northern slope, receiving less sunlight, will require a longer period for bringing the tobacco to maturity. It has more time for storing up gummy substances. An eastern exposure will make tobacco intermediate between that grown on the northern and southern exposures, while that grown on western slopes will be more like that grown on a southern slope, as it receives more of the heat of the sun than that grown on an eastern exposure.

If time permitted, I might go on and tell how variant are the tastes and fancies of the different nations in the selection of the types of tobacco to be consumed by them. The Norwegians and Swedes, for instance, want the strongest tobacco grown, which they are said first to chew, then to smoke, and then to snuff the ashes. The Germans want the "black fats" and also a sweet tobacco, of fine stem and fibre, cherry red in color or mottled with yellow. It must be porous so as to take in the sauces with which it is treated in its manufacture. This is known in the American markets as the German saucer. The French requirements call for a milder red tobacco, or the White Burley types; the Italians want tobacco of a dark brown color, strong, smooth and silky in texture; the Austrians want a type of solid fine texture and glossy sheen, of uniform brown color, tough and stretchy; the Spanish take the lowest grades of lugs and light types; the English take many sorts, but one essential requirement is that they must be absorb-

ent, strong and elastic in texture, that the tobacco may be spun into rope-like strands. The negroes of Africa take the longest tobacco that is shipped from America. This, they make into a large cigar, not less than twenty-six inches in length, soak it in lard or palm-oil and then the whole tribe sit in a circle and smoke until they become deliriously intoxicated. Nearly all foreign nations prefer tobacco cured by fire. The Americans prefer that cured without fire or smoke.

No other product that enters into commerce is taxed so heavily as tobacco. England levies a tax of 77 cents per pound when it contains 10 per cent of moisture; 85 cents per pound, when there is less than this amount. This is from twelve to fifteen hundred per cent on the prices which farmers receive. Norway, Sweden, Switzerland, Holland, Belgium, and Russia all levy heavy taxes. France, Portugal, Italy, Spain, Austria and Turkey make a monopoly of tobacco. All tobacco is sold directly to the governments last mentioned, is manufactured by them and sold to consumers. France, however, in order to accommodate her thousands of guests, will permit the introduction or rather the importation of tobacco for the private use of the importer upon the payment of $694.80 per hundred kilograms. This is $3.15 per pound and is probably the highest duty ever paid upon any article of consumption. These countries making a monopoly of tobacco are called Regie governments.

William H. Glasson: I come from the part of North Carolina referred to by Mr. Killebrew on account of the infertility of its soil and I was, therefore, much interested in what he had to say about the effect of the introduction of the culture of bright tobacco on the

prosperity of that region. A striking illustration of the development based upon the culture and manufacture of this plant is seen in the present city of Durham which was, at the close of the Civil War, a very unimportant railway station near which Sherman received the surrender of Johnston's army. Then it was the home of a few scattered families. To-day it is a widely known city—typical of the new manufacturing South—and containing with its several suburbs from twelve to fifteen thousand people. This growth has been based upon the bright tobacco industry, supplemented by the manufacture of cotton goods.

An interesting story is told of the way in which the fame of Durham tobacco was first spread abroad. The manufacture had already been begun in a small way when Sherman's army arrived at Durham. It is said that some of his soldiers broke into a factory or storehouse where the bright leaf tobacco was kept, and helped themselves. This proved so satisfactory that after they had gone North they began to send back to Durham from all parts of the country, orders for tobacco. Such orders materially aided in the growth of the Durham industry. Johnston's army surrendered to Sherman, but Sherman's men were taken captive by Durham tobacco.

THE COTTON INDUSTRY

D. A. TOMPKINS

A very brief summary of the history of cotton production in the United States is taken from my book, "Cotton and Cotton Oil," as follows:

"For the ancient history of cotton, dating 1000 years before Christ, the practical man of to-day cares very little. Even the minor details of its introduction into the United States possesses only historical interest, and these will be taken up only to illustrate the evolution of the industry.

"The early colonists naturally experimented on their new found soil with all the divers seeds that they could obtain from all parts of the earth. Thus, cotton became an early experimental crop, beginning in Virginia about the year 1600, and continuing in all the southern latitudes for nearly two hundred years before it came to be seriously regarded as a useful crop.

"During this epoch a great army of hand weavers had sprung up in England, and it was becoming a serious problem with them to get yarn to weave.

"In all times and places, when there is a serious demand for any invention, the genius of the age soon develops and perfects that invention. In 1767 James Hargreaves invented in England the spinning jenny, by which one operative could run as many as twenty spindles, instead of one, as theretofore. This was successfully improved by Arkwright and Crompton in England, and others, so that it soon became an easy matter to provide yarn for the hand weavers. After the power loom had been introduced by Cartwright, also in England, in

1785, the world's consumption of all kinds of yarn increased immensely, and thus the demand for raw textile fibres was a constantly growing one.

"The American colonists took a growing interest in cotton production and made every effort to meet the demand from the mother country, and also the new demands of the new independent colonies.

"In 1786 Governor Tattnal, of Georgia, received some Sea Island seed from the Bahama Islands, and encouraged its production in the coast region.

"About the same time a Mrs. Burden, of South Carolina, promoted its growth on the sea islands of that state.

"Several difficulties prevented the rapid spread of cotton culture in those days. Scarcity of labor in the new country, due to the tedious process of harvesting or "picking" was an important factor, but the prime difficulty was in separating the useful lint from the then useless seed. This work was done entirely by hand until the ancient roller gin was brought over.

"As in the invention of other machinery, a crying necessity stimulated genius. The roller gin was already in use, and worked well for Sea Island cotton. In 1793, Eli Whitney, then living near Savannah, Ga., invented a cotton gin, comprising many of the features of the gin now in use for upland cotton. In 1794 he obtained his patent. In 1793 Hodgen Holmes, of Augusta, Ga., invented the saw gin, an improvement on Whitney's machine. In 1796 he obtained his patent. Thus in the period from 1793 to 1796, the saw gin became a standard machine, and an epoch maker in the history of cotton.

"The effect of this invention upon the cotton production of the country was wonderful. As soon as a few of these machines could be made and put upon the market,

it was seen that with the available labor it was easy to increase the cotton production many fold.

"In 1790 the production of cotton was equivalent to 3,000 bales of 500 pounds each, and in 1798, about the time the use of saw gins became general, the production was increased to an equivalent of about 30,000 bales of 500 pounds each.

"It soon became apparent that the productiveness of the soil would justify much more cotton planting than the available labor could handle, even with the help of the cotton gin. This idea fostered a great importation of negro slaves, and thus the growth of slavery and the increase of the cotton crop were simultaneous, each being sustained by the other. This material result was in opposition to a strong sentiment against slavery.

"The cotton crops steadily increased on this basis, building up and enriching an agricultural population which became an aristocracy in the southern United States. The cotton crop had grown to 4,000,000 bales in 1861, being mostly produced by the labor of the 4,000,000 slaves.

"From 1861 to 1865 the Civil War interfered with agricultural operations so that the average annual production during that period was reduced to a half million bales. The Civil War resulted in the abolition of slavery. The ill-advised enfranchisement of the slaves who were led by dishonest adventurers, induced a condition of political and industrial disorder. This condition retarded the recovery of the cotton growing states from the disastrous effects of the war, and hence it required about ten years after the war for the cotton planters to again reach a production of 4,000,000 bales. Since that time, the crop has continually increased, reaching to nearly 10,000,000 bales in 1900, as exhibited by the following table."

The following table showing the growth of the industry and prices obtained in different periods is taken from the same source.

THE PRODUCTION AND PRICE OF COTTON FROM 1790 TO 1900.

Year.	No. Bales 500 lbs. Gross.	Price per lb. in New York.
1790	3,000	26.0
1791	4,200	26.0
1792	6,300	29.0
1793	10,400	32.0
1794	16,700	33.0
1795	16,700	36.5
1796	20,800	36.5
1797	22,900	34.0
1798	31,200	39.0
1799	41,600	44.0
1800	73,000	28.0
1810	177,000	16.0
1820	331,500	17.0
1830	669,800	10.0
1840	1,737,700	8.9
1850	2,083,800	12.3
1860	4,668,900	11.0
1865	250,000	80.0
1870	2,862,300	24.0
1880	5,449,200	12.0
1890	7,311,400	11.5
1900	9,436,400	8.7

It may be said that the development of cotton culture went from a mere beginning to 10,000,000 bales in the 19th century. The value of 10,000,000 bales on to-day's market is $600,000,000. In the latter half of the century the seed have been made the basis of an industry yielding products worth $100,000,000.

There were those who thought that slave labor was essential to the continued development of cotton production. The important inventions, chiefly those of Whitney and Holmes, upon the basis of which cotton production was made profitable, were all made before

slavery became dominant. No other improvements were made until after the abolition of the institution. Since that time, great and continued progress and many important inventions and improvements have been made. Events since the dis-establishment of slavery have shown that slave labor is not essential to produce cotton. It transpires that the institution of slavery not only prevented the development of manufactures but dried up those which had been established before slavery became the dominant influence in the South. In the first decade of the 19th century Virginia, the Carolinas and Georgia led the rest of the United States in manufactures. By 1850 the manufacturing interests of the slave states had been reduced to nearly nothing as compared to those of the free states, thus limiting the occupations of the people to the production of cotton, tobacco, sugar and rice with slave labor.

I conceive that slave labor never has been of advantage in the development of cotton production. Laws necessary to the maintenance of slavery drove out the free white labor, hindered and ultimately stopped immigration. This element emigrated very largely as slavery grew in importance and influence. Throughout the first half of the 19th century there was a tide of emigration from what had been the manufacturing sections of the slave states to what was then the Northwest, now comprising the states of Ohio, Indiana and Illinois. In this tide were the Harrisons, Thurmans, Stevensons, Lincolns, Cannons, the present speaker of the national House of Representatives being one of these, and many, many others. Another tide of emigration was to the Southwest, this being composed of those who believed in slave labor and who required more land or new land to work upon.

Because of this emigration the slave states did not grow in population and wealth in proportion to their resources. Staple crops was all that could be depended upon, and while the system made a few people rich, it destroyed those markets which manufactures furnish for perishable farm products and therefore made it impossible to produce cotton so cheaply as in an environment where farm products have cash markets.

Since the abolition of slavery there has been developed a large and important industry based upon cotton seed as a raw material. The cotton seed products are cotton oil, cotton seed meal, linters and cotton seed hulls. The aggregate value of these is now about $100,000,000 annually. The hulls and meal are very superior feed for cattle and the value and economy of this feed has brought about the development of the business of raising and fattening cattle. At some of the oil mills, several thousand head of cattle are annually fatted for the markets. In the environment made by slavery, this large source of wealth would probably never have been found and developed.

The invention of the cotton gin by Whitney and Holmes is the basis upon which the development of a large production of cotton was made possible. Patents were issued for these inventions in 1794 and 1796. Up to this time the Southern states had been settled and developed on lines exactly parallel with the settlement and development of the Northern states. The South was actractive to the European. Slavery had existed of course but very much as it had in New England or Pennsylvania. Manufactures flourished, commerce was prosperous, and all the conditions were about the same as in the other states. When the national government was formed,

Virginia headed the list of states, Pennsylvania came second and North Carolina third.

The cotton gin made cotton planting so profitable that the slave became of great value as a laborer. Where cotton would grow the slave was put to work in the cotton field. Most of those in the rest of the United States were bought and the slave trade was made brisk by the demand for slaves direct from Africa. The laws soon began to take the shape most favorable to cotton planting with slave labor. The manufacturers of wool, of iron, of wagons, and other articles became interested in the new movement and invested money in land and slaves instead of in the extension of their factories. The free labor was driven from the country or to a life of poverty on poor land.

In the new situation existing to-day we find the following conditions:

(1) Manufactures have been re-established and the manufacturing populations make markets for perishable farm products and these incidentally reduce the cost of cotton.

(2) Commerce has again become prosperous and this sustains transportation, thus enabling commodities to reach markets quickly and cheaply.

(3) All influences favorable to emigration are gone and emigration has practically ceased.

(4) All influences adverse to immigration are gone and large numbers of people are actually coming into the cotton growing states from the North. The conditions are very favorable for the European immigrant.

(5) The maintenance of the fertility of the land by the use of commercial fertilizers is now well understood and there is an enormous business in commercial fertilizers carried on under state control.

(6) The price of cotton is high enough to encourage its production alone on a farm. With the new markets for perishable farm products in addition to high-priced cotton, farming has become a most attractive proposition in the cotton growing states.

I have in the past pointed out that America must make an abundant and reasonably cheap supply of cotton or some other parts of the world would supplement her crop and take away the practical monopoly she enjoys. Already Egypt and India are producing more cotton than we did thirty years ago. I conceive that conditions are now more favorable for the economic production of cotton in the United States than ever before. The growth of the production in Egypt and India has been during a period of confusion and re-adjustment of political and social conditions in the cotton growing states. From this time forward good government and political order seem assured. As slavery was an adverse influence here, so the social conditions in Egypt and India handicap them in their competition with us under our new conditions of freedom and education.

It has been suggested that the new manufacturing interests are drawing so much labor from the farms that our production of cotton must of necessity be checked. This is within limits true. In the state of North Carolina, fifty thousand people, practically all natives, are now working in cotton mills. Probably as many more are employed in furniture factories, saw mills, cotton mills, on railroads, and or are in other ways connected with the new developments. If the same number has been employed in new developments in ten cotton states, this would represent a million people who have left the farms. This has relieved the cotton farmer of a tremendous

competition and has also made markets for his products other than cotton.

This makes a very attractive condition for the European immigrant and by the new environment of freedom and educational facilities the European immigrant will surely be attracted. I have no doubt but that the United States will continue to lead the world in cotton production and in future, supply at a fair price, an ample quantity of the staple to meet the demands of the world.

The influence of the cotton gin on cotton production was incalculable. We have come now to a situation where a successful and economic picking machine would be of incalculable value. It costs now about $100,000,000 to pick the crop. The picking is done with the fingers and the strength of the picker is wasted in leaning and bending the body. A machine to which man power might be economically applied ought to reduce the cost of picking to $50,000,000, and one to which mule or horse power could be applied ought to reduce the cost to not exceeding $20,000,000.

An essential prerequisite for the maintenance of the present production of cotton and its further development is to keep the markets of the world open to American made goods. It would seem as if our access to Chinese markets, especially those of Manchuria, is now seriously threatened by Russia and this in violation of treaty agreements made between the allied nations at Pekin after the Chinese War.

Those who have given special study to this subject express great alarm lest Russia not only drive us out of Manchuria but ultimately out of all China and the entire Orient. These claim that with Manchuria gained, Russia's position in the Eastern markets would be so

strengthened that she could more easily take each succeeding step until the whole territory is covered. Then by the control of enormous populations, she could command the political control of the world. If these apprehensions are true, we have in this country, the farmer and manufacturer alike, a far greater interest at stake in the Japan-Russia controversy than our government appreciates. The value of an Isthmian canal would be tremendously diminished if we were to lose our markets in the Far East.

In the matter of slavery we were not wise. Through that system an error insidiously crept upon us which nearly wrecked our progress before it was fully corrected. In regard to preserving and extending our markets it is to be earnestly hoped that our government will not remain supine in any case where action is needed to preserve conditions necessary to the maintenance and further development of our cotton industry both in the field and in the factory.

C. C. THACH: Though deposed from time to time by various economists and up-to-date agriculturists, cotton was never more of an absolute "King" than to-day. The world-wide scramble for the staple, the phenomenal leap in price to the highest mark since the years immediately succeeding the Civil War, the fierce struggle for the control of the market, the grave apprehension as to the adequacy of future supply, as to labor, as to the boll-weevil, the deterioration of seed and other pests and perils to production, the possibilities of cotton culture in regions other than the South,—these and other manifold phases of the cotton question fill the public press, and attest the vital importance of the commodity to the entire country, indeed to the entire world.

In truth, it is well-nigh impossible to overstate the supreme importance of the cotton industry in the South. As a matter of fact, cotton is the staple agricultural product of ten states in the Union, embracing a population of 18,116,000 people, or about one-fourth of the entire United States. At an average price of ten cents per pound, the crop of 10,000,000 bales as estimated by the Department of Agriculture is of tremendous financial value, aggregating the immense total of $500,000,000. The advance since last December from eight to twelve cents a pound represents an increase to the Southern planter of $200,000,000 over any crop that he has ever raised,—about $80,000,000 of the increase being still to accrue upon the cotton yet in the hands of the producer.

The South is the cotton store house for the world, producing three-fourths of the world's supply. For generations to come it will hold practically a monopoly of this great product.

While I hasten to express my hearty endorsement of the main contention of the distinguished gentleman who has preceded me, yet, I ask to briefly call in question the proposition advanced "that slavery was never of any advantage in developing a system of cotton production." The question is, indeed, a long one, and is perhaps of only academic interest; yet from the stand point of economic history it is of value.

Certainly if slavery may not have been an advantage, it was the actual social condition under which the cotton raising industry was planted, fostered, and developed in America. As a social organization or machine, it was a most efficient agency for getting work done. Without the negro the development of the Southern states would have been retarded half a century or longer, at least until the great tide of immigration had flowed over the Appalachian watershed, and covered the fertile reaches of the great Northwestern territory.

Yes, the winning of the South was largely the work of the negro. Unquestionably his tropical origin, and greater immunity from malignant malarial diseases peculiarly adapted him to the severe drudgery of felling the forests, draining the marshes, and subduing to cultivation the more fertile sections of the semi-tropical country in which cotton was found to thrive.

And the efficiency of the system of slavery in the growing of cotton is fully established by the statistics in the case. The decade from 1850 to 1860, for instance, shows as great a percentage of increase in production as any decade in the history of the country,—being, indeed, greater than nearly any other consecutive ten years. In 1859–60 the crop was 4,861,202 bales, an amount not again attained until 1878–79, eighteen years later, and thirteen years after the close of the war,

although the population had increased meanwhile nearly forty per cent. In fact, the increase in production of cotton since the war has not kept pace with the increase in population in the South; *e. g.*, in 1860 the cotton crop was 4,861,202 bales; in 1900–1, 10,383,422 bales, an increase of 113 per cent, the population of the cotton states being for the same dates respectively 7,513,000, and 18,116,000 or an increase of 140 per cent.

As a mere agency for producing cotton, I repeat, slavery was eminently efficient. Of course the mere production of raw cotton does not constitute an ideal economic state, and every one knows that the institution of slavery stifled the mechanical and scientific spirit of Southern society, and made impossible the highly organized, complex industrial life which in the New South is fast supplanting the idyllic agricultural life of the Old South.

As a result of this social revolution one of the most noteworthy changes in regard to the production of cotton since the Civil War is in the labor now employed. Mr. Carnegie in a recent utterance is pleased to ascribe the 11,000,000 bales of the annual crop to the labor of the negro. If the man on the ground may differ with the one so remote from the conditions under discussion, I should say that the amount of cotton made by negro labor grows gradually less every year. It is the universal opinion of those who should know, that as the generation trained in the school of slavery passes away, negro labor becomes, in the mass, less efficient. Moreover, large numbers of negro laborers are drawn annually from the fields to the large industrial enterprises developing so extensively in this section. Now the falling off in negro labor is made good, in part by a gradual increase in white labor, small farmers of the

tenant class with two or three plows, who are entering governmental lands, or subdividing the larger plantations. Statistics on the relative amounts grown by the two races are difficult to secure, but the generalizations made are based on close personal observations and wide inquiry.

As every one knows, this was impossible under the old order of things. With a system of slavery, agricultural labor, in fact, all manual labor was a badge of social inferiority. Moreover, there was a gradual acquisition of all desirable lands by the landed aristocracy,—the large wealthy planters—with the inevitable result of the rapid emigration of the middle and lower classes of the white population from the agricultural sections of the South. For example, up to 1860, according to census reports, a larger number of people had emigrated from South Carolina (a small and stationary community), than had moved into South Carolina from all the other states of the Union.

This change to white labor has been greatly facilitated by the introduction of a new factor in cotton culture that is worthy of note. I refer to the use of commercial fertilizers. As a rule, the lower classes of society had their holdings in the hill-country in the less productive soils, the "black belt" lands having been found best suited to the most profitable employment of slave labor on a large scale. But by the use of this new agency, vast regions once considered barren have been brought into profitable cultivation, and now really afford a more reliable and constant crop than the rich alluvial soils of the old slave plantations. In nearly every agricultural county in the South there is to be observed, on the one hand this section of fertile soils, once the heart of the old civilization, now largely abandoned by the

whites, held in tenantry by a dense negro population, full of dilapidation and ruin; while, on the other hand, there is the region of light, thin soils occupied by the small white freeholder, filled with schools, churches and good roads, and all the elements of a happy enlightened country life.

The yearly investment in commercial fertilizers is enormous, 628,000 tons valued at $17.00 a ton being consumed in Georgia; 250,000 tons in Alabama; 325,000 in South Carolina; 350,000 in North Carolina; and 425,000 in Mississippi. The total amount of fertilizers produced in the United States in 1900 was, according to the census, 2,887,000 tons, all but 1,000,000 tons of which was used exclusively in the cotton producing states, being an investment of over $30,000,000.

As a result of the demands for fertilizers, and, too, of the industrial growth of the South, an immense new profit has come to the producers of cotton in the sale of their seed. A few years ago a farmer's surplus seed were often regarded as a nuisance while to-day the by-products of the seed—the meal, oil and hulls, are a most valuable asset, amounting in 1900 to $42,000,000, and in 1902, according to Mr. Edmonds of the *Manufacturer's Record*, to over $100,000,000. After the oil is extracted, the seed loses nothing in value as a fertilizer, the meal being our richest nitrogenous material, while the hulls prove an excellent feed for cattle, or if used for fuel, the ash affords a most concentrated form of potash.

Time forbids but a bare allusion to the wonderful growth in the South of the manufacture of crude cotton into forms of finished products. Thirty years ago the capital invested in all the mills from the Potomac to the Rio Grande would not have aggregated $3,000,000:

to-day it approximates $175,000,000; spindles have increased from 667,000 to 7,500,000 and the South now manufactures one-half of all the cotton now consumed in the United States. Larger population, higher wages, increased purchasing power of operatives, a higher standard of life, better school facilities, and a general uplift in the community life are some of the attendant results.

And great as is the economic value, still greater is the sociological value of this new form of factory-village life. For this mill people is drawn not from foreign immigrants nor from distant states, but it is drawn from the poor native-born, white population. Now for the first time in their history, they are organized into community life and taking their first step toward civilization and enlightenment.

An important factor in the future development of the textile industry in the South, whose influence will be felt more and more each year, is the excellent system of textile schools being established throughout the Southern states. Artistic taste, the knowledge of underlying scientific principles, skill, and intelligence,—in a word, brains, are required for the full development of any industry.

The apprehension expressed in some quarters of a significant decline in the annual yield of cotton appears entirely baseless. The great diminution of the present crop seems entirely attributable to unfavorable seasons. No crop has ever been cultivated under more adverse circumstances. Furthermore, a study of the cotton record for the last fifty years discovers a frequent occurrence of violent fluctuations much more extreme than at present, the minimum limit being 150 pounds, the maximum, 225 pounds per acre,—the crop of 1860

being, for instance, twenty-five per cent less than that of 1859. One must believe that the combined scientific genius of America will eventually find a stay for the ravages of the boll weevil. Nor can there be any danger in the deterioration of seed arising from the cotton seed oil industry; for no discrimination whatever is made either by the seller or the purchaser in the seed that are disposed of.

The question of most vital concern to-day in the production of cotton is the question of labor, both as to supply and as to intelligence. Negro labor is becoming restless, higher wages and things much more inviting than the mule and the plow are drawing him from the country regions. There is, in fact, a very keen rivalry for his services among the land owners. And how is his place to be supplied? Gradually, I have said, by the natural expansion of the white race, but still more rapidly, it seems, should the supply come from immigration. No where in the United States is there to-day a more inviting field for the small farmer than in the South.

And, above all, if we wish to regenerate our agriculture, and produce more cotton, more corn, more pork, we need more education, more intelligence. Few, indeed, are the farmers who are able to apply to cotton culture the beneficial results of labor saving machines, or the recent discoveries pertaining to their business. Knowledge, indeed, is power, and Mr. Sully's 25,000,000 bale crop will never arrive until there obtains in our general farming population a higher order of intelligence, mental alertness, and a more intimate knowledge of the great principles controlling the art of agriculture.

However, of one thing we may rest assured as stated in the beginning, the sceptre of King Cotton will not

pass from the South at any near date. Certain climatic conditions of temperature, moisture and distribution of gentle rain fall, combined with a favorable soil and, at present, a vast body of labor available for harvesting make the South the ideal region for the culture of cotton; and under the stimulating influence of the high prices now prevailing, the acreage for the approaching year will doubtless be greatly increased, and with favorable seasons it may not be rash to prophesy a crop of 12,000,000 bales.

THE UTILIZATION OF SOUTHERN WASTES

RICHARD H. EDMONDS

Saving labor in one direction and creating an enormous demand for labor in another, the invention of the cotton gin more than a hundred years ago caused an immeasurable waste of material and energy in the South. It hastened the passing of slavery in the North, but strengthened the institution in the South, giving the plantation the premiership and halting, though not destroying, the natural mechanical bent of the whites. It changed the course of American industrial tendencies, and diverted the flow of commerce. It made the history of the United States. It resulted in the evolution in the South of a system of agricultural labor unsurpassed in effectiveness in spite of its costliness. It supplied the raw material for industries both at home and abroad, and at the same time created a great market for manufactured articles and farm products.

But its consequent benefits were enjoyed by a minority of the Southern people. Not more than 30 per cent of the Southern white families in 1860 were owners or hirers of slaves. Their real and personal property dominated a situation giving the South more wealth per capita than the rest of the country—a situation well typed in 1850, when the per capita wealth of the whole country being $304, that of South Carolina was $431, the 384,984 slaves being included in the population of 668,507. Yet, at that very time, it was estimated by the governor of the state that among its white inhabitants there were not less than 50,000 persons whose employment was not sufficient to give them the honest support every white citizen felt himself entitled to. Conditions in South Caro-

lina were, perhaps, exceptional in some respects, but they fairly illustrate general Southern conditions. During the ten years before the Civil War the chance for the depressed classes to become economically valuable was somewhat bettered, especially in those portions of the South where slavery was slowly and naturally disappearing under the practical impulse that had destroyed it in the North. Then came the war with its enormous waste of human energy, life and wealth. It brought the great mass of whites to a common level of poverty. In the consequent struggle for the maintenance of race integrity they were practically debarred from production, except to meet bare necessities, and the negro race, which had never advanced except as it was guided or controlled by white intelligence, was suddenly placed in a position calling for self-reliance with its younger generation subjected to methods of training, which converted them from possible producers of thorough efficiency into thriftless dawdlers or positive parasites. The South received practically nothing of that immigration, which, after the war, gave such an enormous impulse to the development of the North and West. As a result of the war, it lost potentiality through the disorganization of an important element in its labor system.

One at first thought may not readily understand that the direct and indirect wastes of the past forty years have created the opportunity for the utilization of other wastes. Investments in Southern cotton mills, equipping them with the best machinery, need not include the money sent to the scrap pile in the shape of antiquated machinery. A mass of labor, long dormant because of a comparatively narrow field for its employment, has been given freedom at last to follow its natural inclination. Costly industrial experiments have been tried elsewhere,

but the South as a whole, with its natural resources lying fallow, has escaped them and their accompanying evils. It is in a position to profit by the experience elsewhere without any great loss of time and money, or waste of energy and material.

Seventy years ago oil was made from cottonseed in Mississippi, and, subsequently, at Mobile, Ala., Petersburg, Va., New Orleans, La., and other points, the seed was a basis of industry. Far-seeing minds of that day sketched the part that the products might play in cattle feeding, in the manufacture of soap and candles, in lubrication, painting, illumination and as a food. About that time the legislature of Mississippi passed a law to compel cotton gins to remove promptly or to destroy all cotton seed, so that the same might not become a prejudice to the health of the community. The general practice was to get rid of the seed by dumping it into running water or letting it rot, though there was an early use of it to a limited extent as a fertilizer. It was not until about 1870 that the cotton oil mill began to assume any importance in industry, and ten years later there were but 45 mills in the South with a capital of about $3,500,000. The census of 1900 reported 369 establishments engaged solely in extracting the oil, with a capital of $34,451,461 and a value of crude products only of $42,411,835, only 55 per cent of the seed produced in the South being crushed.[1] It is estimated that the total annual value of the product of the 700 oil mills, not including the output of enterprises dependent in part upon oil mills, approached $125,000,000, while

[1] An estimate made in April last placed in the Cotton Belt 702 cotton oil mills built and in course of construction, with 50 or 60 new ones chartered, the mills with their refineries and other auxiliary features representing an investment of $225,000,000.

the value of the lint cotton in that year was $360,000,000. The short lint secured in re-ginning the seed at the oil mill is manufactured into cotton batting. The hulls become fuel, ashes, fertilizer, fibre, paper and cattle feed. The meats become cake and meal used for fertilizer, cattle feed and crude oil. This last in various processes becomes soap stock and soap, the stock mixed with other greases appearing in the cylinders for phonographs, winter yellow oil, cottonseed stearin, a basis for butter and salad oils, including not a little of the substance imported as olive oil, summer white oil, a basis for lard and cottolene and miners' oil.

Fifty years ago objection was made to the cottonseed oil mill on the ground that it prevented the return of nutriment to the land, and consequently tended to impoverish the soil. Today the contention has been made that the most productive use of the cotton seed is in feeding it to cattle, enriching the soil with the manure and selling the cattle as beef. It is also argued that the mills paying the biggest prices for the best seed is resulting in the raising of inferior cotton. Both of these possible evils, not always inseparable from the early career of a new industry, may be overcome through the attraction to the South of the packing-house industry because of the value of cottonseed to it.

In the packing industry the blood of animals was once allowed to drain away, and the removal of such stuff as heads, feet, tankage, etc., was paid for. Now, blood, bones, horns, hoofs, hides, sinews, trimmings, etc., are transformed into tallow, soap, glue, gelatine, bristles, hair, felt, soap powders, glycerine ammonia, bone meal, poultry food, albumin, neats for oil, pepsin, knife handles, buttons, fertilizers and a host of other articles. The packer by making a chemical fertilizer of use in the cot-

ton field, by using the cotton oil stearin in the manufacture of compound lard and cooking butters, and through his need of the cottonseed meal for feeding purposes, has begun to move to the South, nearer to the cattle-raising sections of the South-west. During the past past ten years at least $20,000,000 have been invested in abattoirs and meat-packing plants in the South, exclusive of local slaughter-houses and minor packing establishments, while about $8,000,000 of the packer's capital have been invested in the manufacture of fertilizer. This is but a small proportion of the millions engaged in the Southern fertilizer industry in which cottonseed plays such an important part.

That southward movement is but a part of the general tendency of manufacturing capital to get as close as possible to the sources of raw material, exemplified most notably, in a cotton mill built by New England manufacturers in the cotton field of Alabama, using as fuel coal from a vein which was struck in digging the foundations of the mill.

The southward movement has been hastened by the exhaustion of raw material in other parts of the country. In part, that is why the capital invested in lumbering in the South increased between 1880 and 1900 from $23,546,076 to $181,702,526, the latter sum being half a million dollars greater than the total capital invested in lumbering in the whole country in 1880. That is why the value of the lumbering products in the South increased in the twenty years from $39,930,432 to $188,114,524. It is regrettable that the South has not been free from the wasteful methods in handling its timber that have desolated vast regions elsewhere. The results of such methods appear in the apprehension that the time may not be far distant when the South's import-

ance in the naval stores trade shall have waned. In 1900 the capital invested in the turpentine industry producing resin, spirits of turpentine and rosin was $11,847,495, employing about 42,000 persons and producing to the value of $20,344,888. About that time Dr. Charles H. Herty, a professor at the University of Georgia, began to study the methods of the workers among the long leaf pines, and his investigations, re-inforced and expanded under the auspices of the national Bureau of Forestry, are bringing about a modification for the better in turpentining. He found that boxing the trees not only speeded their end, but did not secure all the possible product. He introduced a system of cups and gutters which in the first year of its trial resulted in an increase of 23 per cent in the product for a given number of trees. This increase, according to a recent statement of the bureau, has been raised to 36 per cent. In two years the number of cups in use has increased from 20,000 to 3,000,000, and the readiness of the operators to accept the new system is indicated by the fact that a pottery company that planned to supply them with the earthen cups has been unable to fill its orders as fast as they have been received and has been obliged to decline orders for more than 2,000,000 cups.

The supply of turpentine seems likely to be maintained for some years by the chemical treatment of dried pine knots, stumps, and the waste of cut-over timber lands, through what is known as the destructive distillation process. This was attempted as early as thirty odd years ago, but unsuccessfully. Interest in it has revived with the growing demand for turpentine and with the recent perfecting of apparatus. It is claimed that at one of the eleven plants using this special apparatus, ten cords of ordinary pine yielded in 36 hours distillation

960 gallons, which by separation gave 260 gallons of turpentine, 200 gallons of creosote, 100 gallons of oil of tar and 300 gallons of tar with about 100 gallons of acid waste. From ten cords of rich fat pine the average yield in the same time was 1,337 gallons of crude distillates, from which were derived 352 gallons of turpentine, 250 gallons of creosote, 150 gallons of oil of tar and 400 gallons of tar with 185 gallons of acid waste. Men who have studied this question are convinced that conducted upon a scientific and business basis, the process will yield rich results. Certain it is that pine stumps have risen in value and plants are in course of erection in different parts of the South.

Already, too, men are seriously discussing the feasibility of combining sawdust and cement, or some other binder, in the manufacture of fence posts. We have read newspapers printed in Texas upon the fabric of pine shavings, and this response to the search for material for paper points also to rice straw, while the reported lack of success from the economic standpoint in the use of bagasse, the waste of the sugar-cane, has not deterred other enterprise in that direction, for within the past few weeks, it has been announced that Boston capital will establish near New Orleans a mill to reduce bagasse to pulp to be used in the manufacture of paper board.

Coincident with these efforts to make the waste of lumbering available in industry, there has been a decided movement in the South for scientific forestry in coöperation with the Bureau of the Agricultural Department or on independent lines. In the plan for a great forest reserve in the southern Appalachians, which has a national support, an impetus has been given to the development of another natural resource of the South, its

water powers. In the early days, the water powers of the South, free all the year round, were held to be one of its chief advantages in manufacturing. Some of them were used locally, and the canal idea for the transportation of such power was developed on a modest scale. But hundreds of thousands of horse power continued to be lost for fifty years, and only recently has an adequate attempt been made to capture the rivers for direct or indirect use in manufacturing. Now, considerable progress has been made with the James at Richmond, with the Roanoke at Roanoke Rapids, with the Chattahoochee at Columbus and Atlanta, with the Savannah at Augusta, with the Tallapoosa at Tallassee Falls, including a system of transmission to Montgomery and at other points, while plans for the development of the Appomattox in Virginia, of the Catawba in North Carolina, of the Ohio at Louisville, of the Tennessee at Chattanooga, of the Black Warrior and its tributaries in Alabama, of the Yadkin in North Carolina, of the Colorado in Texas, and of other streams, are already being carried out or are being seriously considered.

Did time permit, one might give more than mention to the possibilities in the re-claimation of swamps, overflowed alluvial lands, and stretches of prairie. A thought of what has already been accomplished in rice-growing under modern methods in southwest Louisiana and southeastern Texas, and of the 30,000 square miles of the richest soil in the world in Arkansas, Mississippi and Louisiana which will be brought under cultivation by the proper improvement of the Mississippi River and its tributaries, will indicate Southern potentialities in this field.

Most of the projects for the utilization of Southern wastes are under way; others are still to be undertaken.

Preliminary to the realization of such aims must be the utilization of what is, perhaps, the greatest waste in the South, the waste of human energy through neglect or through mis-direction. As we survey the past twenty years against the somber background of the twenty years earlier forbidding aught save hope, we are justified in congratulating ourselves upon the recent material progress of the South. The advance between 1880 and 1900 in the value of farm properties from $2,290,364,321 to $3,951,631,632, and of farm products from $660,131,452 to $1,271,654,273; in the amount of capital invested in manufacturing from $257,244,561 to $1,153,202,368; in the value of manufactured products from $457,454,777 to $1,463,643,177; in railroad mileage from 20,612 to 52,594; and in the value of exports from Southern ports from $261,214,904 to $464,316,943, could hardly have been paralleled by any other country situated as was the South in 1880.

With but 27 per cent of the land area of the country and with its population increasing during twenty years 44 per cent, while that of the rest of the country augmented by immigration increased 55 per cent, the South's investment in agriculture increased 72 per cent, while that in the rest of the country increased 65 per cent; the South's capital in manufacturing increased 348 per cent, while in the rest of the country it increased 242 per cent; the value of the products of Southern factories increased 219 per cent against an increase of 135 per cent in the rest of the country, and today, while sending through its ports 35 per cent of the exports of the country, the South is producing about 40 per cent of the total exports. There is the record of accomplishment and of wonderful accomplishment if the matter of percentage of increase is alone considered.

But there is another way of looking at the subject. A hint is given in the fact that though the value of farm properties in the South increased at a greater rate than in the rest of the country, the contrary was true for the value of farm products. As a matter of fact, in certain particulars, such as the production of grain and the raising of live stock, the South is not as well off agriculturally as it was in 1860, in spite of the increase in population. In certain of the older States the per capita production of grain is less. While the actual number of neat cattle is greater, the 15,000,000 owned by the South in 1900 are a smaller proportion of the 50,000,000 in the country than were the 8,500,000 in the South of the 17,000,000 in the whole country in 1860. Moreover, their number was actually smaller in 1900 than in 1860 in half a dozen of the States, while in the forty years there was a decrease in the whole South of more than 1,000,000 in the number of sheep and of more than 950,000 in the number of swine. Again, while the South is pre-eminently, as it long has been, the producer of the cotton, the sugar-cane, the rice and the bulk of the tobacco and sweet potatoes of the country, it raised in 1899 but 28 per cent of the corn of the country as against 44 per cent in 1860, and but 12 per cent of the wheat as against 26 per cent in 1860. In spite of its unexcelled advantages of climate and soil it raised, however, in 1899 but 21 per cent of the small fruits of the country, 18 per cent of orchard fruits, 17 per cent of the hay and forage, 11 per cent of Irish potatoes, and 7 per cent of the oats. In the census year the number of persons engaged in agriculture in the South was 5,127,035, and they produced $248 per capita. In the rest of the country the 5,254,730 persons engaged in agriculture produced $655 per capita. The showing in manufact-

uring is somewhat better for the South than in agriculture, notwithstanding the fact that the South has so long been regarded as a distinctively agricultural section. For, while the 4,529,120 wage earners in industry in the rest of the country were occupied in production to the value of $11,546,393,337, or $2,549 per capita, the 785,419 Southern wage earners were concerned in production to the value of $1,463,643,177, or $1,863 per capita.

In making these comparisons it must be remembered, of course, that persons engaged in agriculture include the employing class as well as the employed, while in manufacturing, only those employed at wages are included. In agriculture the class corresponding to the wage earners in manufacturing represents but about 42 per cent of all engaged in agriculture, while the wage earners represent about 90 per cent of all engaged in manufacing. It should be noted, too, that much of the manufactured production of the South is the result of what may be called the primary movements in industry, such as lumber, cotton yarn, pig iron and crude petroleum, representing, perhaps, a greater weight, but a smaller price than the results of second and third and fourth handling of this material in other parts of the country. A thought of the difference between the value of a pig of iron at Birmingham, Ala., and its value at Waltham, Mass., after it has been converted into steel watch springs, will convey an idea of the difference, broadly speaking, between manufacturing in the South and in the rest of the country. But even in this respect a change is underway in the South. Fine cotton goods are made there, as well as yarn, and the tendency is very rapidly toward diversification and the making of finer goods. High Point, N. C., is a vigorous

rival in furniture-making of Grand Rapids, Mich. Around the furnaces of northern Alabama have grown pipe works, car works, steel, wire and rail mills. On the Texas coast where oil was discovered only three years ago, millions of barrels are being refined for shipment coastwise and to foreign ports.

Still, all that should be done is not done, either in agriculture or in manufacturing. That is not because the South is not fully at work. The increase in the assessed value of property there between 1880 and 1900 from $3,051,175,098 to $5,457,553,031 and between 1900 and 1902 to $5,916,960,712, or at the rate of nearly $230,000,000 a year, is a fair indication of energy, even allowing for changes in assessment schedules. There is another even more significant fact. There are more persons in proportion to the population engaged in gainful occupations in the South than in the rest of the country. But the females constituting 16 per cent of the persons engaged in agriculture in the South, including, of course, the large number of female negroes in the fields, are a mark of the comparative backwardness of farming there not to be overcome by natural advantages. Women constituting 25 per cent of the persons in mechanical pursuits in the rest of the country, mark of the highest development of the age of machinery with its effectiveness in production. The contrast is the broad distinction between industrial conditions in the South and in the rest of the country.

It is the immediate explanation of the fact, modified though it may be by the enormous contributions of Southern agriculture and manufacturing to the commerce and the industry of the rest of the country, that

the South is not making as much of its opportunities for wealth production as is the rest of the country.

The opportunities are here, but neither are there a sufficient number of persons to develop them, nor are the number available sufficiently qualified to develop them completely. The lumber camp, the oil mill, the mine, the furnace, and railroad construction attract the negro males from the plantation and the farm. Wherever the heavy work of Southern industry is under way, there will be observed a tendency of negro males to outnumber the females. The cotton mills in the older states attract the whites from the small cotton farms, the movement being checked now and then by high prices for the staple. Thus there is a halting of growth in one direction with an undue acceleration in another. In some respects the South may be regarded as burning its garments to keep itself warm, and that too, under the most strenuous economic compulsion.

For the primary remedy the South needs inhabitants. In its 807,045 square miles there are but 23,548,401 persons, or 29.1 to the square mile. What this average really means appears from the fact that the density of Ohio is 102, of Indiana 70, and of Illinois 86. The South must let it be known that it has abundant offerings for the farmer and equally abundant places for the worker in other industries. With all its progress it is still very, very far behind such a section as New England, with 90 persons to the square mile, largely dependent directly or indirectly upon products of the South for the means to exercise their talents as wealth producers.

With increased population and better means of communication and greater wealth flowing from that in-

crease, the South will be in a better position to provide the means for the proper education of its workers, and in the elaboration of the plans already mapped in the broadest sort of way will, in wisdom born of experience, evolve a readjustment of its labor system, permitting the individual to advance with the least waste of energy and of time upon lines most productive for the community.

THE RELATIONS BETWEEN RENT AND INTEREST[1]

FRANK A. FETTER

Part I. Negative Criticism of the Conventional Rent and Interest Concepts

1. Logical clearness and practical needs call for a re-examination and restatement of the economic concepts of rent and interest.

This proposition expresses the thought of many contemporary economic students. The thought is reflected in the recent remarkable revival of interest in this phase

[1] The argument in this paper, forced into excessive brevity at many points, should be interpreted in connection with other essays by the writer, published from time to time in the past three years. Arranged, as nearly as their special nature permits, in a logical series, they are as follows:

1. The next decade of economic theory, Publ. of Amer. Econ. Asso., 3d ser., vol. 2, no. 1, p. 236–246, (read Dec. 29, 1900). Points out the relative and temporary nature of the old concepts of rent and of capital, and suggests the general direction that may be taken in their restatement.

2. The passing of the old rent concept, *Quar. Jour. Econ.*, vol. 15, pp. 416–455, (May, 1901). A detailed criticism, purely negative, of Marshall's doctrine of quasi-rent, as typical of the prevailing unsettled condition of thought on this subject.

3. Recent discussion of the capital concept, *Quar. Jour. Econ.*, vol. 15, pp. 1–45, (Nov., 1900). A review of the contributions of Clark, Irving Fisher and Böhm-Bawerk to this subject, criticising especially the last named in his distinction between social and individual capital, between consumption and production goods, between natural and produced agents; concluding with a positive statement of a concept of capital, as distinguished from wealth.

4. The "roundabout process" in the interest theory, *Quar. Jour. Econ.*, vol. 17, pp. 163–180, (Nov. 1902). A criticism of Böhm-Bawerk's "Positive theory," showing that his retention of a defective capital concept is the cause of his retaining (inconsistently) a productivity theory of interest; concluding with a suggestion of the true relation of productivity to a theory of interest. The present paper unites, and develops somewhat, the various arguments in this series of articles.

of economic theory. The truth of the proposition is, however, not recognized by all. Some look upon the Ricardian doctrine of rent as an eternal verity, and deem the agitators of new economic concepts to be the pernicious disturbers of theoretical calm. Some economists cling to the traditional views as some theologians cling to out-grown creeds, oppressed with the thought that if the ancient faith gives way nothing can take its place. With rock-ribbed conservatism argument is vain, but such an attitude has one considerable justification: the recent rent controversy has been almost entirely of a negative character. The period of destructive criticism has elapsed; but erroneous concepts will not be discarded until positive and practically applicable ones are put in their places.

2. The generally accepted definitions of rent and of interest are imperfect in that they mark only a small portion of the boundaries of the concepts actually employed.

Criticism of definitions should not be unreasonably exacting. It is sufficient that the definition state the essential characteristic of the concept, for it is impossible to include in a sentence all the logical and practical developments of the central thought. It is no vital fault that the statements that rent is income from natural agents, and that interest is the income from products used in production, do not tell everything about rent and interest. But the prevailing belief is that all of the essential contrasts of rent and interest so much dwelt upon for a century past, result from the one defined and simple difference as to the kind of goods yielding the income. In fact, however, the concepts of rent and interest are not developed along parallel lines, other most fundamental terms being unconsciously introduced into them. The prevailing concepts of rent and interest, therefore, have an exceedingly complex character, and what is

worse for clear thinking, this complexity is concealed beneath a simple form.

The two propositions above state the negative portion of the thesis to be here maintained. Part I of this paper, given to negative criticism, is continued in propositions 3 a, b, 4, 5 a, b, c, and summarized in 6, these together forming a demonstration that the conventional rent concept contains several conflicting thoughts. Part II, consisting of propositions 7 a, b, and 8 is an examination of two possible but inexpedient ways of making the rent and interest concepts formally consistent, by developing propositions 3 and 4. Part III, the positive solution, points out in propositions 9 a, b, c, the logical and practical line of distinction to be found in propositions 5 a, b, c, when they are consistently developed, and concludes in 10 and 11 with the outline of a new theory of distribution.

3a. Since the beginning of modern economic theory, rent and interest have been defined by social marks; rent has been said to be the income of land owners, interest that of merchants, manufacturers and city men of wealth.

This distinction deserves mention, when the most recent and one of the keenest critics in this field expresses himself as follows: "It is a commonplace of historical economics that land was first given the rank of a factor in production coördinate with labor and capital for the simple reason that in England, the home of classical political economy, the landlords formed a social class distinct from the capitalists and laborers."[1] Adolph

[1] A. S. Johnson, Rent in modern economic theory, p. 19, Publ. Amer. Econ. Asso., 3d ser., vol. 3, no. 4. Probably most students would not consider this explanation a commonplace and would even deny that it truly states the principal cause of the distinction in question. The author quoted makes it the main thesis of his book that the difference between land rent and interest, though thus originally observed as a merely transitory historical fact, remains of permanent significance.

Held, probably the first to suggest this origin, states quite dogmatically, without discussion, that "the social classification appeared so sharply in England that Adam Smith accepted it without question, and accordingly distinguished the kinds of incomes without inquiring how far property in land and capital belong together."[1] However it originated, this thought of rent as a personal income of the members of a social class, persists to-day, as may be seen in many representative definitions.[2] The conscious distinguishing of the conceptions of economic and contract incomes is a recent phase of thought, as yet but slightly reflected in the formal definitions. Ownership, though frequently thus included in the definition, has not played an essential part in economic discussion because, as used, the definition became a mere truism. Goods and incomes were not classified according as they belonged to members of different social classes, but, on the contrary, social classes were distinguished according as they were receiving incomes from particular kinds of goods. The income of the landlord as a person was made up of the yield from such varied agents that to the personal mark (membership in the land-holding class), necessarily was added at once an impersonal mark (the kinds of agents yielding the income.) A man was considered to be a landlord if his most important income came from land. As the thought of rent as landlord's income and as income from land never have been very sharply distinguished, we may designate this second phase of the thought as 3b.

3b. Rent, in the conventional treatment, was there-

[1] Zwei Bücher zur socialan Geschichte England's, p. 160.

[2] Note for example, Ricardo, 1817: "that portion of the produce of the earth, which is paid to the landlord", etc.; F. A. Walker, 1887: "the remuneration received by the landowning class", etc.; Marshall, 1890: "the income derived from the ownership of land," etc.; Bullock, 1897: "the return that is secured by the owner", etc.

fore said to be the income derived from natural agents, and interest that from produced, or artificial agents.

When this is made, as it was, the central thought of rent, that part of the income of landlords that is derived from improvements is excluded and is declared to be interest. A minor fallacy then appears in that rent is either landlord's income or income from land, as is most convenient to the immediate purpose of the writer. The principal thought in rent remains, however, that of income from the use of natural agents. The grave difficulties in the application of this thought will be later criticised (In 7b). Other ideas now to be noted were, however, from the first, associated with the original thought.

4. The characterization of rent as that income from material agents which does not enter into cost of production, and of interest as the income which *does* so enter, was a shifting of the central thought of the concept; what was, at first, thought to be a merely incidental peculiarity of land rent, became its essential feature, and then the center of a more general concept of rent.

If this idea did not originate with Malthus and Ricardo, it was emphasized strongly in their criticisms of Smith as the main peculiarity of land rent. The supposed peculiarity of the relation of land rent to price rested on fallacious reasoning, due to the unconscious introduction of new conditions into the concept.[1] The gradual displacement of the earlier conception of rent as income from land, by the no-cost-of-production concept, is one of the interesting chapters in the history of economic theory. First, the no-cost camel thrust only its nose into the tent, then it crowded out entirely the former occupant. To-day the no-cost concept is in large degree dominant, although the old definitions, the

[1] This question is dealt with more fully in "The passing of the old rent concept", especially pp. 432-452.

old arguments, and many inconsistent conclusions of the older treatment remain. Marshall's treatment of rent and quasi-rents shows the orthodox order of distributive theory dissolved into chaos by illogically conserving the older thought while developing a newer one. The quasi-rent doctrine, however, takes a long step in the right direction, for it recognizes the likeness of the yield of land and of other concrete goods.

What is most pertinent to the present purpose is that this thought of rent, as usually developed, is in its nature a compromise. The old idea and the new are entertained, together. The same old formal definition is retained; the newer distinction, brought in to modify and explain, only complicates and confuses the rent concept. Certainly none of the contemporary supporters of this view have as yet framed a definition that is more than temporizing. But even if a choice were made between these two essentially different concepts of rent (and of interest) ambiguity would not be banished, for in all the older discussion of rent and interest another distinction has been assumed whose significance usually has been quite unsuspected, but which in fact contains the key to the problem.

5a. An essentially different distinction between rent and interest is tacitly introduced into the discussion when the amount of the bearer, or source, of rent is expressed in physical terms as to quantity and quality, while the bearer, or source, of interest is expressed in the general value unit as a principal sum.

That this distinction is made a part of the conventional concepts will be recognized by all students of economic theory. Equally evident is it when once attention is called to the fact, that this is done without recognizing the changed point of view thus taken toward the two kinds of goods. The Columbus of economic

theory who stood this egg on end is Professor John B. Clark. All the standard texts declare, in discussing interest, that capital consists of concrete goods, and is neither mere money nor mere abstraction, yet at the same time they speak of capital as of uniform quality and as yielding a uniform rate of income. This is said to contrast capital strikingly with land, which is measured by the acre, and differs from unit to unit. Professor Clark, in his brilliant criticism of this confused thought, has vividly pictured the varying grades of "capital goods" as he calls them, and has shown that artificial agents can be viewed in concrete form and expressed in physical terms in the same way as natural agents usually are. Most students, therefore, are ready to recognize the truth of a statement that would have been startling some years ago: the contrasts supposed to reside in the objective differences between natural agents and capital are but subjective differences due to the points of view taken by the thinker when he chooses to express the quantity of goods in different modes.

These differing modes of expressing the bearers of the two incomes involve corresponding differences in the conceptions of their maintenance and of their income. As these conceptions are but phenomenal forms of the thought expressed in 5 a, the statement of them will be numbered 5 b and 5 c.

5b. In estimating its net income, the bearer of rent is thought of as materially unimpaired by use, being preserved in identical form or in kind; the bearer of interest is thought of as maintained of undiminished value, expressed in terms of some conventional standard.

This is a contrast in point of view that is entirely unrelated with the contrast presented in the formal definition, and confusion results. The taking of different points of view is allowable; indeed, it is necessary if all aspects of any subject are to be considered. The inconsistency is

in unconsciously shifting the point of view and believing that the differing natures of the objects were the cause of the differences observed. Two similar houses viewed, the one from the front and the other from the rear, appear to be very differently planned. The one blind man who got his idea of the elephant by touching the tusk is said to have argued long with the other who had caught hold of the animal's tail. Debates as hopeless as this, result from the shifting of the concepts here under discussion.

A side light on the theoretical analysis above may be given by a brief suggestion of the historical conditions in which the distinction took its rise. The rent contract, almost universally employed in the Middle Ages in transferring the temporary control of wealth, involves a legal fiction. Land, houses, cattle, whose use is delegated to the tenant, must, according to the terms of the contract usual in such cases, be returned in the same condition as when borrowed. The performance of this contract is literally and physically impossible; but by means of agreements as to repairs and replacements, the agents can be restored in equally good condition. Every rent contract for the use of agricultural land is in its terms a disproof of the idea that rent is paid alone for the original and indestructible qualities of the soil; yet the fiction of a perpetual rent-bearer deceived Ricardo and has continued to deceive. The interest contract came into use much later, as a money economy arose; hence, its employment was confined, until the last century, almost entirely to money loans and to the transfer of city wealth. This chance historical parallelism between land, rent, country and landlord on the one hand, and machines, interest, city and merchant on the other, explains many of the fallacies that beset economic thought in the first conscious attempts to analyze value.[1] The rent con-

[1] This thought was stated with a somewhat different emphasis in "The next decade of economic theory," pp. 243-244.

tract and the interest contract are not in any essential way connected with land and produced agents respectively, and the chance use of them for transferring certain kinds of goods has within the last century become less and less common. The contrasting form of contract in rent and interest (and a corresponding contrast in the mode of estimating the income bearer in economic rent and interest) was introduced into the older concepts alongside of the formally recognized characters, making the concepts complex and contradictory.

5c. Contract rent (corresponding with the thoughts in 5a and 5b) is treated by all writers as an absolute amount, not as a percentage of the income bearer; contract interest is treated as a percentage of a principal sum. A similar distinction is made in the case of economic rent and economic interest at certain moments.

The conception of economic income being more subtle than that of contractual income, is less easily grasped. Contractual income is personal, economic income is impersonal. While it was contractual rent that drew the attention of the earlier economic students, it is economic rent (using the term in a broader sense than mere land rent) that constitutes the real problem in economic theory.

Here also a word of economic history throws light on the origin and occasion of this distinction as applied to the contractual incomes. The theorists of 125 years ago found contract rent in extensive practical use. While mainly used in reference to the income of land, the word rent was taken in a much more general sense both in English and in the continental languages. Houses and machines were then rented as pianos and automobiles are now. At first the income from land was specifically distinguished as "land rent," but Ricardo's authority specialized the term "rent" in English economic theory, and,

ever since, economists have struggled in vain to establish their word usage in the place of that sanctioned by many centuries. A part of every conventional discussion of rent is given to explaining that "in the economic sense" it means only the income from land considered apart from improvements.

The renting contract doubtless was the exclusive mode by which the temporary use of wealth was given and acquired in primitive communities. It certainly continued throughout the feudal period to be all but universal in the rural economies. The interest contract was an impossibility until the rise of a money economy. Money came into use first in the cities, and there also was felt most strongly the inconvenience of the renting contract. The ventures of the merchant at home and abroad required goods so various in quantity and quality, so difficult to measure exactly except in terms of value, that the borrowing of them was hardly possible except in the form first of general purchasing power, that is, under the interest contract. And it is so to-day. The differing practice was due to business convenience, not to an essential difference in the economic nature of the goods, and while in fact machines can be and are "rented," land and other natural agents are often temporarily acquired nowadays under the interest contract. As contractual incomes both rent and interest are found alternating in practice, and just because the contracts are so different in outer form, the incomes appear to have in many ways essentially different characters.

6. There are thus included in the generally accepted concepts of rent, without formal recognition, three essentially different and often conflicting thoughts:

(a) It is the income of a special social class, marked by the ownership of a special class of physical agents (the characteristics being somewhat shifting).

(b) It is any income having a special relation to price, namely, that "it does not enter into the cost of production".

(c) It is an income that is yielded by wealth measured physically and that is expressed as an absolute sum.

In each case rent is in contrast with interest which is (a) received by a different social class, and from a different class of agents, or (b) has a supposedly different relation to the value of products, or (c) is estimated as a percentage of a principal sum or value of wealth.[1]

If the incomes from wealth are to be grouped logically and classified practically as rent and interest, the three foregoing tests must be applied to each income as it appears. It is assumed in the conventional treatment that these tests give consistent results. Unless, however, the three tests are logically related, it is incredible that the results of their application should coincide in more than a small number of cases. Indeed, every contradiction that is possible by combining these independent tests occurs at one time or another in the conventional treatment of rent. The entire collapse of the old rent doctrine has been prevented only by failure to apply the tests to all cases and in full measure. The thought is shifted as convenience suggests. Starting with the formal definition framed about the first thought, the treatment shifts to the second or third. Such a method cannot be defended as a legitimate employment of a continuity concept. Continuity does not justify the cross-logic of a three-fold or four-fold principle of classification. There is no continuity in the jump from natural agents to consumer's rent, or from landlord's income to the contract to restore in kind.

[1] Still other distinctions find partial recognition in current economics. See "The passing of the old rent concept", 423-431, for a discussion of space extension and of time in this connection.

In concluding the merely negative part of this paper it should be reiterated that propositions 3, 4 and 5, summarized in 6, are to be interpreted collectively. In the foregoing argument it has not been maintained that any one of the three principal thoughts contained in these three propositions cannot be made formally logical if it is developed by itself consistently. It is, however, maintained here that when these several thoughts are employed together without a recognition of the resulting complexity, fallacious contrasts and conclusions result. Differences between rent and interest, that are assumed to arise out of the nature of the two classes of agents, are but the reflection of the changing subjective attitudes of the theorists.

In Part II is to be considered the logical character of the concepts resulting from a consistent development of each of the first two thoughts here recognized.

Part II. Exclusion of Two Possible Formal Solutions of the Inconsistencies

7a. Formal consistency might be gained if the distinction between rent and interest were made to turn on the difference in the social classes that receive the incomes; but this is almost purposeless in economic theory.

A merely formal concept of rent might be framed about the thought of a social class. Rent might be defined as the income of wealthy men or of those moving in the best society. English conditions naturally suggested to the thinkers of a century ago the contrast of agricultural land holders and city men of wealth. But it is safe to say that no such social classification ever has been or ever could be presented that is either exact or significant enough to serve in the analysis of value. The economic theory of value is essentially an attempt to explain impersonally the origin and degree of importance of

goods. The social class concept of rent thus involves a distinction not primarily economic, and one that is incapable of even a moderate degree of exactness in practical application. When, moreover, membership in a social class is tested by ownership of a particular kind of agent, the social aspect of the concept almost disappears. The connection of the thought of land rent and landlords as a class could continue only in the peculiar social conditions of England, and then it corresponded only in a broad, not in an exact way, with realities.

7b. Formal consistency is possible if the distinction between rent and interest be made to turn *solely* on the difference in the classes of physical agents that yield them; but this distinction is quite incapable of practical application.

The only classification of wealth that ever has been suggested for this purpose is that into natural and artificial, or unproduced and produced agents, or land and "capital." Such a classification may be required to meet two tests. It is expedient only if the two classes of agents can be practically distinguished by marks or evidences that can be taken account of in the practical world; it is logical only if it is consistently applied.

Land in an unimproved state is rare if not unknown in modern societies. As nearly every concrete thing is a bit of natural material adapted artificially to some degree to man's use, everything according to this conception should have in it elements of capital and interest, and elements of land and rent. No practicable method of deciding whether a thing is land or capital ever has been suggested, much less applied.[1] When one considers the nature of the case, it appears impossible even to conceive of such a test.

[1] The ablest attempt to face this difficulty formally, that of Böhm-Bawerk, in his "Positive theory," pp. 55-56, is quite unsuccessful. A criticism of his argument is given in "Recent discussion of the capital concept," pp. 30-39.

Therefore economic theory, unable to make the division between land and capital along a concrete and objective line, has been led to make it along an abstract line. Rent was said to be the income from land "considered as unimproved," or "considered apart from improvements;" while interest was that part of the income of land that was to be considered as due to improvements or to produced agents. Ricardo put it that rent is paid to the landlord for the use "of the original and indestructible qualities of the soil." Few writers that have accepted the Ricardian definition, have failed to apologize for the evident error in the phrase. Ricardo apparently meant, not that all qualities were indestructible, but that they might be spoken of as undestroyed, if annually repaired. Indeed it would be difficult to find a writer that does not, both in theoretical and practical problems, give up the impossible task of distinguishing all the value due to improvements on land. It is so much easier to wave the difficulty aside by "incorporating" or "merging" the improvements into the land. It has not been recognized that the original thought has thus been departed from, that the practical difficulty has been slurred over, and that a metaphysical division has been substituted for a concrete classification. The designating of an improved field as land or natural agents, and of an improved piece of iron as capital, becomes a purely arbitrary matter. The test is not found in immobility. Are the Suez Canal, the Hoosac Tunnel, the ploughed field, land or capital? A touch of human labor is at one time believed to convert the entire material into capital, a larger amount of labor at another time is declared merely to incorporate itself with the land and become indistinguishable from it.[1] The notion

[1] This idea as held by Böhm-Bawerk is more fully criticised in "Recent discussion of the capital concept", p. 37.

that it is a simple matter to distinguish between the yield of natural agents and that of improvements is fanciful and confusing, is responsible for many errors, including the cruder part of the single tax doctrine. The distinction doubtless more nearly approaches business realities in the case of city building sites than in that of agricultural land. It must, however, be maintained that the objective classification of land and capital as natural and artificial agents is a task that always must transcend human power of discrimination.

The vagueness of the line between natural agents and capital is increased by the fact that money and artifical agents measured as "capital" can be and are so often invested in land. Where land becomes a commonly marketed form of wealth, the classification of rent and interest according to the social class of owners becomes meaningless, and the classification accorded to kind of agents grows quite out of harmony with business usage. An attempt to meet the difficulty is seen in the more recent contrast between capital from the individual and capital from the social point of view, which is an abandonment of the distinction according to the class of agents in most of its possible applications. This complicates instead of solving the difficulty, which must be logically met.[1]

8. Formal consistency may be gained if the distinction between rent and interest is made to turn on their supposed relation to cost of production.

It is always a scientific service to carry to its extreme possibilities any abstract distinction, for thus only can be made apparent its merits and defects. In the gradual enlargement of the no-cost-of-production notion of land rent (noted in proposition 4) until it becomes the essen-

[1] The "land concept of rent" in the somewhat complex form as held by Marshall, is criticised in "The passing of the old rent concept", pp. 418-423.

tial thought in the rent concept, the view of Mr. John A. Hobson represents nearly this ultimate development.[1] Moved by the desire to find a basis in the theory of rent for a juster system of distribution and of taxation, he re-examines the problem and arrives at the conclusion that "the law of rent, in its extreme application, is valid for each factor." A fund is required as well to keep land and labor, as to keep capital in repair, above which sum, he thinks, the differential expenses of production "whether they be rent, interest, or wages, will not enter into the market price of the supply." While he thus narrows the conception of rent in some ways, he widens it greatly in others. He retains, though after modification, the notion of a no-cost-factor, and broadens it greatly. He stops just short of rejecting the whole distinction between land and capital as unproduced and produced agents. As a result of this and other recent criticisms, a doctrine of general rent, or of quasi-rent, is the dominant idea regarding rent to-day in many minds.[2] As a negative criticism Hobson's essay has the highest merits, demonstrating, as it does, how illusive are many of the supposed peculiarities of the various incomes in the older treatment of distribution. His idea of cost and "no-cost" factors is moreover closely in touch with realities, for cost in his discussion is a very concrete thing, representing the repair and replacement fund needed for each factor. Moreover, there is for the theory of social legislation much suggestiveness in the idea of the surplus feature in each income that is above "cost," and therefore amenable to taxation. For all this,

[1] "The law of the three rents," article in *Quarterly Journal Economics*, vol. 5, p. 263; restated in his "Economics of distribution," 1900. Likewise in vol. 5, p. 289, appeared John B. Clark's remarkable paper on "Distribution as determined by a law of rent."

[2] The change in the rent concept is reviewed in "The next decade of economic theory", pp. 241-242.

Hobson's treatment does not yield a satisfactory solution of the problem of the rent concept, notably because rent is left quite unadjusted, and unrelated to, the interest concept. Though Hobson, in concluding, expresses the hope that he has laid the basis for a "sound theory of distribution," he recognizes the complexity of his concept and the difficulty of its application.[1]

The distributive system presented by Dr. C. W. Macfarlane[2] is, however, a further step into abstraction. That writer, believing that any given factor may, at a given moment, have various relations to price, reaches the somewhat bewildering conclusion that land (which "includes all natural forces except labor") and entrepreneur's service, each may yield both rent and profit; capital may yield rent, profit and interest; and labor may yield rent, profit and gain. Whether and how far any income is thus to be named depends on whether it is "price-determined" or "price-determining", a transcendental inquiry as difficult to apply as the small boy's method of catching birds by salting their tails. As the conception that some incomes bear a peculiar relation to price grows out of fallacious reasoning, no logically sound classification of incomes can be based upon it.[3] But if it were sound, it still would be the extreme of abstraction, confined to the most subtle and probably useless economic speculation. Even if such a no-cost-of-production concept of rent could be made formally logical it still would lack expediency for a theory of distribution.

[1] "The law of the three rents," pp. 287-8.

[2] Value and distribution, 1899.

[3] The mistaken origin of the no-cost concept is shown in "The passing of the old rent concept", especially pp. 446 452.

Part III. Positive Solution of the Theoretical Problem of Rent and Interest

9a. Consistency must be gained by substituting for the older futile distinctions, that between the wealth aspect and the capital aspect of material goods.

Neither the physical classification of agents, nor the metaphysical classification of abstract types of income, affords an answer to the theoretical and practical problem of rent and interest; but in the consistent development of the third important thought contained in the old and confused rent concept, the desired solution is found.[1] Rent and interest, until recently, have been looked upon as corresponding respectively to two different factors of production. In recent criticism the idea of correspondence or parallelism between each factor and its income has been abandoned, but the two material factors (natural and artificial) are still retained. A better positive theory must clear up the confusion as to the differing nature of these factors. Present in the thought of the older economists, along with the distinction between natural and artificial agents, and coloring their conclusions, has been the distinction here suggested. Durable goods were sometimes thought of as yielding uses (the wealth aspect), but land was the only important class of agents that was regularly so viewed. Durable goods were sometimes thought of as saleable at their present worth (the capital aspect), but only produced agents, the materials and instruments of manufacture, were usually so viewed. Both classes of agents can be looked at consistently from either point of view, can be considered either as bearer of rent, or as discounted sum of rents, either as wealth or as capital. It is in the confusion of these contrasts that most of the old opposition between income from land and income from

[1] This solution was implied in the capital concept presented in "Recent discussion of the capital concept", pp. 40-45.

artificially produced agents was found. This fog is lifted when the sources of rent and of interest cease to be considered as physically distinct and objectively differing kinds of goods, and are seen to be simply the same body of income yielders, differently viewed, calculated and expressed for theoretical and practical purposes.

9b. Corresponding with the distinction between the wealth aspect and the capital aspect of material goods, are the differing thoughts as to the maintenance of the factors.

In the earlier industrial stages when exchange is rare and money but little known, it is inevitable that the uses, or rents, of durable agents should be primarily thought of. In estimating the uses, allowance must first be made for keeping the agents in physical repair. This calculation is necessary not only in making the rent contract, but in conducting the individual economy, if net income is to recur. As was shown above, the supposed durability of land and of its qualities for which rent is paid, is largely an illusion due to ignoring its constant repair. The preserving of the rent-bearer in identical form or in kind is essential to the concept of a perpetual rent.

As the money economy displaces the barter economy, and the thought moves from the valuable present rent to the present saleable value of the rent-bearer, the capital sum of value is thought of as kept intact before a net income from it is estimated. This is a primary condition of the contractual money loan, requiring the repayment of a principal sum apart from interest, and this becomes the leading type of modern business calculations.

The blunder of the older economics in connecting land and rent with the one mode of calculation, and artificial agents with the other mode, has been noted above in proposition 5. Not only is it possible to view both aspects of use-bearers consistently, but clear theory and sound business practice require that this be done.

9c. As a necessary result of the distinction between the wealth and the capital aspects of agents, and of the thoughts as to the maintenance of the factors, rent must be expressed as an absolute amount, and interest as a percentage of a principal sum.

This is stated mainly for formal completeness, but it emphasizes the retention of a feature of the older treatment whose significance was unsuspected. In fact the expression of interest as a percentage marks interest as the form of income most connected with mobile and saleable agents, it makes of interest a "marginal" factor in price, a fact so much emphasized in the older treatment, it connects interest peculiarly with the element of time, as so many writers have felt it should be. Yet the percentual form of expressing interest is impossible when the income bearer is measured by physical norms, it is practically inevitable when the income bearer is expressed as a capital sum.

10. The rent and interest concepts, when looked upon as successive steps in the analysis of value, instead of as coördinate shares dividing between them the income from material agents, are made consistent internally, mutually, and with the foregoing conceptions of wealth and of capital.[1]

It was suggested in proposition 5 that the treatment of land rent as an absolute amount, and of interest on produced goods as a percentage of their value, grew out of prevailing practice in the contracts for the use of wealth. Either mode of expressing income may be logical if consistently employed, and if divorced from the confusing prejudice that the difference is due to the different nature of the factors yielding the two incomes. This error recognized, economic theory must abandon

[1] This conception was briefly suggested in concluding the criticism of Böhm-Bawerk: "The 'roundabout process' in the interest theory", pp. 177-180.

the old distinction as to the differing factors. What is left in place of the old rent concept? All that was best in it, freed of error: rent is the usufruct attributable to any material agent. The uses of material agents considered apart from the using up of the agents, are in this view always and only rents. This is a logical thought, a useful one and one applicable to practical problems.

When to rent has thus been assigned all current incomes from material agents there is no place for the old concept of interest as the yield of produced agents. But rents accrue at different points of time and vary in value accordingly. Present uses and future uses differ. A more or less durable agent represents a series of rents. The capital value of a good is the sum of its prospective rents and uses, discounted at a rate that reflects the prevailing premium on the present. Capitalization, thus viewed, is logically a later stage of the problem of value than is rent; and interest first appears in connection with capitalization. As the market expression of the all-pervasive premium of present over future, interest may appear in connection with any gratifications, whether they be yielded by natural or by produced, by material or by human, by durable or by perishable agents. There is not a writer from Ricardo to the present time by whom this universal application of interest is not vaguely recognized; there probably is not one by whom its application is not more or less inconsistently restricted.[1]

11. The propositions above imply the need of a radical restatement of the theory of distribution, and suggest its essential outlines.

The prevailing theory of distribution rests upon the idea of three (more often lately, four) objectively differing factors, to which correspond three (or four) different kinds

[1] The broader conception of interest was presented in "Recent discussion of the capital concept," pp. 21–30, especially pp. 27–28.

of income. Some later, more subtle, attempts to restate the theory have left it far from realities and quite unusable. Another solution may be found by combining into a logical system the three typical modes in which goods appeal to wants. First, goods appeal directly, as want-gratifiers immediately available. Here is required a theory of wants and enjoyable goods, and the technical analysis of marginal utility. The mental process here examined is chronologically the first stage of evaluation in the history both of the individual and of the race. Secondly, goods appear as more or less durable, and may be made comparable by being considered, through repairs, to be lasting use-bearers, yielding in a given short period a group of uses. Here is the place for the theory of rents. This is chronologically the second stage of evaluation, when durable goods are thought of and expressed in terms of their usufructs. Thirdly, whenever two non-synchronous gratifications, rents or series of rents, are exchanged, they must be discounted to their present worth to be made comparable. Here is required a theory of capitalization, that is of economic interest. This is historically as well as logically the latest stage of evaluation, characteristic of a developed money economy and of a " capitalistic " era. These three phases must be observed in every complete analysis of value. They are in some respects analogous to the three dimensions in geometry. The older economic theories were curiously crude caricatures of such an analysis. The cost-of-production theory of the exchange value of commodities, (assumed to be the whole theory of value) roughly corresponded only with the first. The old theory of land rent caught a fragmentary view of the second. The old theory of interest on a narrowly conceived class of " capital," was an ineffective attempt to express the third. The theory of value in the present conception

proceeds from the simple to the complex, from the immediate to the distant gratification, from the goods directly in contact with the senses, to those whose utility is indirect and only in expectation. While the negative criticism of the past three decades has wrecked the old distributive theory, many admirable positive contributions, widely diverse in character, converge to the solution here presented.

THE RELATIONS BETWEEN RENT AND INTEREST—DISCUSSION

THOMAS N. CARVER: I do not find so many stages in the development of the rent concept as the paper before us attempts to trace. It seems to me, on the other hand, that the development of that concept has been comparatively simple and logical. But in trying to trace this development, we should first distinguish sharply between the technical concept and the popular concept, each of which has had a development of its own.

The technical or scientific concept started with the idea of rent as the income derived from the ownership of land. Then it was discovered that this income had certain characteristics, aside from the question of its source, which made it unlike other incomes, the most important of these characteristics being that the rent of a given piece of land was the difference between the price of the product and the cost of producing it on that particular piece of land. Rent was, hence, a kind of surplus, or unearned income, in the sense that it came to the landlord without his having done anything to produce it. Then the concept of rent was broadened in one direction, so as to include any other form or surplus, or unearned income, and narrowed in another so as to exclude that part of the income from land which might be said to be earned by the person receiving it, namely, the income from improvements. In other words, rent came to be regarded as a surplus income, rather than the income from land, though the income derived from the ownership of land was still regarded as the most important form of surplus income. It is this change in the concept which alone makes such terms as producer's

rent, quasi rent, consumer's rent, composite rent, etc., intelligible. This, I believe, is the only essential change which the technical rent concept has undergone, and I believe, moreover, that the change was a logical one, and that this later form of the concept can be successfully defended, though there may be good reasons for giving it some other name than rent.

The idea that rent does not enter into cost of production, or that it is not a factor in price, derives whatever validity it has from the fact that rent is a surplus or unearned income. Unfortunately this idea has been supported by the inconclusive, not to say ludicrous, argument that if rent were remitted it would not affect price. It is, of course, equally true to say that if wages were remitted, prices would remain the same. It all amounts to saying that if those who receive one share in the product of any industry should decide not to take it, those who receive some other share would get it, but it hardly seems worth while to spend time in demolishing such an argument.

There is, however, a sense in which rent does not enter into cost or into price, which can not be affirmed of either wages or interest. This makes a valid distinction between the rent of land and the income derived from the ownership of produced goods. If any one can explain this distinction away, he will have done something which no one has yet succeeded in doing, though many have tried. The three following propositions can be laid down respecting wages. 1. In order that there may be production, there must be labor. 2. In order that there may be labor, men must receive wages as a personal income; otherwise there will be no labor and no production. 3. Therefore, wages as personal income are necessary for production.

Three similar propositions may be made respecting interest. 1. In order that there may be efficient production, there must be waiting. 2. In order that there may be waiting, men must receive interest as a personal income to induce them to wait; otherwise there will be no waiting, or very little of it, and consequently, very inefficient production. 3. Interest, as a personal income, is necessary to secure efficient production.

Now, obviously, no propositions resembling the second and third in either of the above series can be made respecting rent. Since it is not necessary that any one should receive rent as a personal income, in order to secure efficient production, one is warranted in saying that rent does not enter into cost in the same sense that wages and interest do. These shares are necessary parts of the cost of production in the sense that no one could be induced to take part in production unless he were allowed a personal income of one kind or the other, whereas production would be quite as efficient as it now is even if no one were allowed rent as a personal income.

It may be true, and probably is, that from the standpoint of functional distribution pure and simple, there is no good reason for distinguishing between the income derived from the ownership of land and that derived from the ownership of capital. But a theory of functional distribution which does not in some way throw light on the more important question of personal distribution is about as useless a piece of speculation as ever occupied the attention of a mediaeval schoolman. Instead of holding, as the paper before us seems to imply, that economics is concerned wholly with functional distribution, I should hold that economics does not care a fig for functional distribution except as it helps us to

understand personal distribution. The question of personal distribution is a question of the real world, whereas the question of functional distribution is a question of Platonic ideas. From the standpoint of personal distribution there are abundant reasons for distinguishing between the income from land and the income from produced goods. Therefore, as it seems to me, the development of the technical or scientific concept of rent has been a logical one. That is to say, economists have been justified in distinguishing as they have, between incomes from these two sources. It may, however, still be open to question whether the terms, rent and interest, ought to have been used to express this distinction.

On the popular side the concept of rent has undergone a different development. Though doubtless originally applied to the income from the ownership of land, since that was the most important kind of property let for a lump sum, it was soon expanded so as to include the income from the ownership of any kind of property let in a similar way, *i.e.*, where the property is regarded merely as a material thing, rather than as a quantity of wealth.

The name interest, on the other hand, was doubtless originally applied to the income derived from the ownership of money, because that was the most important kind of property loaned for a per cent of the principal. This is possible only when the income and the principal are alike, or where they can be reduced to the same quantitative expression. But this term was gradually extended so as to cover the income from any kind of property when that property was expressed as a sum of value in terms of money, and when the income could

for that reason be expressed as a percentage of that sum, *i.e.*, as a percentage of its source.

The result of the extension of the rent concept in one direction and of the interest concept in the other, is that in popular usage the two concepts have come to overlap, so far as the sources of the two kinds of income are concerned. That is to say, the same income has come to be called either rent or interest, according as the source of the income is measured and expressed as a physical quantity or as a quantity of value.

Since this is the way in which the business world has come to use the terms rent and interest, it is somewhat unfortunate that the technical use of these terms has taken a different line of development. From this standpoint it may have been wise for Professors Clark and Fetter to have returned to the popular usage. I think, however, that it would have been wiser and less confusing if they had recognized that they were distinctly breaking away from scientific or technical usage and adopting the popular concept, instead of trying to show that there was no basis for the scientific or technical distinction.

If I have succeeded in showing that there is still an important distinction between rent on the one hand and the income from other agents of production on the other, and that this distinction is essentially what the older economic writers declared it to be, and if it is also made clear that there is a logical basis for the popular distinction between rent and interest, then this whole discussion is concerned entirely with a question in the use of terms. The question is, should the terms rent and interest have been used to express the distinction with which the economic writers have been most concerned, or should they have invented new terms to express that

distinction, leaving the terms rent and interest to express the popular distinction. It is not to be inferred that a question in terminology is unimportant, but it is well to recognize that it *is* a question in terminology, and not a question as to the difference in the real nature of the two forms of income.

JACOB H. HOLLANDER: Professor Fetter's paper is a notable example of acute analytical power, squandered in the service of what Mr. Bagehot has termed "conjectural history." Hardly to a less degree than in the previous studies with which he has enriched recent economic discussion, Professor Fetter asserts the past relativity and the present unfitness of the classical concepts of rent and interest. But, now as then, he is not completely exorcised of the vigorous devil with which economic theorists, it appears, have been so long obsessed. His paper undertakes not only (a) to demonstrate the historical relativity and present uselessness of the traditional theories of rent and interest, but also (b) to associate with the old terms novel concepts, unfamiliar he admits, but in harmony, it is claimed with modern industrial conditions.

Upon his critics, accordingly, devolves the task of reviewing three intimately associated but clearly distinguishable queries suggested by his discussion.

1. Are the traditional concepts of rent and interest peculiarly relative to the time, place and condition of their original formulation?

2. Is there no warrant for the retention of distinct laws of interest and rent in any sense approximating their historic significance?

3. Are the new meanings which Professor Fetter would attach to these terms legitimate and desirable?

To the first proposition conditional assent may be given. It has become a commonplace in the history of economic thought that the so-called classical formulae of rent and interest reflect in origin and in content the conditions of economic England of the late eighteenth and early nineteenth centuries. It is perhaps true that the beginning of the theoretical differentiation of rent and interest in English political economy may be traced back to Hume's expression to Adam Smith: "I cannot think that the rent of farms makes any part of the price of produce, but that the price is determined altogether by the quantity and the demand." Certainly James Anderson, writing a few years later, was sensible of one distinctive feature of land as a production good. But at least another generation was to pass before the stirring course of politico-economic affairs in England forced attention to visible contrasts in income derivable from land and from capital respectively. The kernel of the Bullion Controversy was whether the fund-holder should benefit and the agriculturist suffer by a return to the older standard of value. The point at issue in the corn-law dispute was whether the economic policy of England should be shaped in the immediate interest of the landowner or of the capitalist-entrepreneur. This antagonism of interests found theoretical expression in the practically simultaneous but independently conceived studies of Ricardo, West and Malthus—wherein the concepts of rent and interest were sharply distinguished and each connected with an independent, and, indeed, antithetical law of determination. The differential principle of rent promptly entered into and shaped the dominant theory of economic distribution. The system which in 1817 in the preface to his "Principles of Political Economy and Taxation" Ricardo modestly her-

alded as "many important truths, which can only be discovered after the subject of rent is thoroughly understood"—had become a decade later in Malthus' phrase "the new political economy"—supported by James Hill, Torrens, Tooke and, added McCulloch, perhaps its most enthusiastic disciple,—"by all the best economists in the country."

The corner-stone of the new structure was the law of diminishing returns. From this law proceeded as easy corollaries, the well known dicta of the classical theory: "rent is not a component part of the price of commodities," "profits depend on high or low wages," "rents rise as profits fall."

Passing now from the first to the second proposition suggested by Professor Fetter's paper, it will be readily admitted that the mere circumstance of historic origin is, of itself, no argument for the present worthlessness of the traditional distinction. The one rigid test to which the older concept must be subjected, with a view to determining its further right to be, is—does land as a factor in modern industrial organization retain, or even possess characteristics distinctive enough to differentiate land from capital as a production good?

Professor Fetter is clearly of the opinion that such a differentiation is not warranted, and that if rent and interest are to be retained as independent terms in economic terminology, it must be in very different senses from that to which we have long been accustomed. His argument and his negative conclusions, although not without original elements of interest and importance, may for the present purpose and in this connection, be identified with the reasoning made familiar to us by the more detailed studies of Professor Clark, Dr. MacFarlane, Mr. Hobson, Dr. Johnson and others:—"The principle

of rent," Professor Clark has written, "may be applied to the concrete products of all artificial capital-goods, and even to those of workmen. In the same inaccurate sense in which it may be said that the rent of land is not an element in price, the rent of tools, etc., and those of men themselves, or interest and wages, are not elements in price. We can repeat, word for word, the argument concerning the rent of land, making it apply to the rent of men or to that of artificial instruments, and it will be as true in the one case as in the other."

To the present writer it appears that the identity here so explicitly stated is superficial rather than sound, and that the occasion for radical departure from the traditional distinction between rent and interest, in any other sense than that which Professor Marshall has made familiar, is plausible rather than real. The fallacy underlying Professor Clark's analogy, and in so far, Professor Fetter's argument, arises, like so many other troublesome misconceptions in recent theoretical discussion, from neglect of the *composite* character of the law of diminishing returns, that is to say, from failure to recognize the identical and parallel co-ordination of the differential quality of land in extensive cultivation with the principle of increasing costs in intensive cultivation.

If to a definite amount of land be applied successive amounts of labor and capital, the increments resulting from such application will be relatively diminishing; or viewed as a question of value, and other things being equal,—the cost of each increment will be relatively increasing. The agriculturist is obliged to content himself with this shrinking measure, because the only alternative open to him in extensive cultivation is recourse to less productive land. As a matter of fact, the

relative advantage of either method is so slight that he does both. In rigid theory, every additional product is derived, in part, from extensive, in part from intensive cultivation. The two margins advance *pari passu*, and even the marginal increment of product is composite, proceeding in part from no-rent land, in part from no-rent uses of land.

Now, if a definite fund of capital were to be utilized in conjunction with successive quanta of land and labor, or if a given amount of labor were to be supplied with successive amounts of capital and land, it is perfectly obvious that results identical with the foregoing would follow. But such a condition never occurs, except abnormally or temporarily, and the conception upon which it is based seems unreal, profitless and at variance with the theory as with the facts of industrial organization. No entrepreneur will acquiesce in the condition of diminishing returns to labor and to capital, as he does with respect to land. He will not for a single moment continue using additional land and labor with a given amount of capital, or additional capital and land with a given amount of labor, after the point of increasing, or at the most, of constant returns has been passed. In such cases he will satisfy the demand for a larger product by applying the additional land-labor in the one case, and capital-land in the other—to *new* capital or labor, respectively, and not to the old. This new capital or labor will be available—and this is the all important fact—in identical quality with that capital or labor in use, and not as in the case of land, only in inferior efficiency.

Narrowing our further discussion to the contrast between capital and land, and speaking only of normal, long-time production, the crux of the whole matter

seems to be that, viewed as potential production goods, that is as factors necessary for the satisfaction of increased demand, land is available only in diminishing efficiency both in intensive and in extensive cultivation, while capital is available in diminishing efficiency with respect to intensive use, but in identical, homogeneous quality with respect to extensive use.

It is not possible within the few minutes here available to pursue further the line of thought which it is hoped in another connection to develop more fully. Perhaps enough has been said however to suggest that, in the judgment of the present writer, the primary assumption upon which the classical distinction between rent and interest rests, is still operative, and that independent categories demand recognition. Our scientific fathers builded wiser than they knew, wiser, perhaps, than modern critics are always inclined to admit.

Finally, the student of economic theory in its historical development can have but little sympathy with Professor Fetter's disposition to use the old terms, rent and interest, as labels for new, even though entirely legitimate concepts. If the old differentiation has ceased in fact, let us mark its demise by interment of the accompanying theoretical terms, and not dislodge new vials of wrath by the adoption of terminology, both at variance with practical usage and with traditional scientific employment.

CHARLES W. MACFARLANE: I shall confine myself to Professor Fetter's contention: that any income may be converted into interest by capitalizing it at the prevailing rate of discount or interest. In this connection Dr. Fetter writes on page 196: "The capital value of a good is the sum of its prospective rents and uses, discounted

at a rate that reflects the prevailing premium on the present. Capitalization, thus viewed, is logically a later stage of the problem of value than is rent; and interest first appears in connection with capitalization."

In formulating this thesis Dr. Fetter has clearly followed the lead of Professor Clark. On page 337 of "The distribution of wealth" the latter declares that:—"rent then is nothing more than interest regarded from another point of view, it is an aggregate of lump sums each of which is the net earnings of some instrument. It is identical in amount with interest and it becomes interest the moment we reduce it to a fraction of the value of the instruments that earn it."

Professor Clark here holds that the income from land may be converted into interest by capitalizing it at the prevailing rate while Dr. Fetter holds that not only the income from land but that the total income from any "good" may be converted into interest by this very simple arithmetic device. That we can by such a device convert any income into the form of interest, or express it as a fraction of the total value of the agent producing this income will hardly be questioned, but this, it seems to me, is quite a different thing from converting such income into interest in fact as well as in form.

Let us return to Dr. Fetter's formulation of this doctrine. The capital value of a good is the sum of its prospective rents and uses discounted at a rate that reflects the prevailing premium on the present, etc.

If he will change this so that it will read,—the capitalized value of a good—I fancy that few of us would take exception to the statement. In a word the capitalized value say of a railroad would undoubtedly include any monopoly advantage it might enjoy through its franchise, but can we as economists say that the capital

value of the road includes any such monopoly surplus. If "capital value" and "capitalized value" are equivalent terms then as we have said the difficulty disappears, but it is hardly fair to Dr. Fetter to assume that he would coin a new compound term when we have an equally apt term in familiar use. What then does he mean by the term "capital value" or in brief what concept of capital can he here have in mind. On page 182 he recognises the great importance of Professor Clark's distinction between "capital goods" and the "social fund of capital." It is therefore fair to ask which of these concepts he has in mind when he talks of the "capital value of a good." That the "good" he here has in mind is Professor Clark's concept of "capital goods" need hardly be urged. If so, then there would seem to be strong ground for thinking that his "capital value" of the good corresponds to Professor Clark's "social fund of capital." If this interpretation is correct then Dr. Fetter's thesis resolves itself into the following:—the share of the social fund of capital embodied in any capital good may be determined by capitalizing its total earnings at the prevailing rate of interest. If this is what Dr. Fetter means, and I submit we are left to guess at his meaning, then Professor Clark's distinction between the two concepts of capital may as well be pigeon-holed for they are here hopelessly confounded with one another. Professor Clark has himself written that all monopoly influences where in the "capital goods," the social fund of capital having neither part or lot in any monopoly surplus. If this is true then why confound confusion and ignore the fundamental economic distinction between monopoly and non-monopoly conditions by calling the monopoly earnings of our hypothetical railroad interest and this on the sole ground that by a

mere arithmetic device we have converted these earnings into the form of interest or expressed them as a fraction of the value of the railroad or "capital good" in question.

Dr. Fetter tells us that the capital value of a good may be obtained by capitalizing its earnings at the prevailing rate of interest. This sounds simple enough but one feels constrained to ask :—What fixes this prevailing rate? Had Dr. Fetter seriously addressed himself to this problem he would have found ample ground for thinking that interest is a non-monopoly surplus. If put to it Dr. Fetter would probably have told us that the prevailing rate is fixed by the marginal productivity of the social fund of capital. He might even have told us that with every increase in its supply this capital would be forced to find employment in less and less productive or profitable industries. But if this is true, then manifestly it is in order to inquire what limits the supply of capital, since this has an important bearing upon its marginal productivity and so upon the prevailing rate of interest. Without undue elaboration it may be answered that this depends on the abstinence or disutility endured not by a Rothschild but by the marginal saver. In brief the prevailing rate of interest is fixed at the point where the marginal productivity or utility of capital is equaled to the abstinence or disutility of the marginal saver. If this is sound then the determination of prevailing rate of interest is a problem in normal or non-monopoly value. From this it follows that the only part of the earnings of any capital good that can be charged up as interest in any sense in which we as economists are justified in using the term, is that part which would be secured under the conditions of free competition. This too should be credited to the social

fund of capital while all surplus above this must be credited to the capital good.

Let us bring this matter to the test of a concrete instance and see if we can re-word the matter in any intelligible way. The cost of production, or if you like the cost of reproduction of certain machines is $100,000. An entrepreneur purchases them at this price borrowing from a capitalist the $100,000 with which the purchase is made. The machines yield a net income of $12,500. In the piping times of an industrial boom when prices are rising and the voice of the promoter is heard in the land the first entrepreneur may be able, on the strength of the above showing, to persuade some one to give $250,000 for these machines, since that would be their capitalized value at the prevailing rate of five per cent, and it may be that the second entrepreneur borrows the $250,000 with which to complete the transaction. We have here a very interesting complication for the question is very apt to suggest itself: which of these amounts, the $100,000 or the $250,000, is the share of the social fund of capital embodied in these capital goods or machines? As what is much the same question, which of the incomes $5,000 or $12,500 is to be credited as the earnings of the social fund of capital? When tried by the test of the amount paid to the capitalist for the use of his money the answer does not seem to be at all clear for while the earning power of the machines has remained the same the amount paid to the capitalist has changed from $5,000 to $12,500. Again when tried by the test of the amount that figures in the cost accounts of the entrepreneurs the result is equally unsatisfactory. For while in the first instance the amount entered on the cost side of the entrepreneur's ledger will be $5,000, the second entrepreneur

would certainly charge up $12,500 as interest on the cost side of his ledger. How then are we to decide. It seems to me this can only be done by return to Professor Clark's fundamental contention "that all monopoly influences inhere in the concrete machines or 'capital goods.'" In a word the mobile homogeneous or social fund of capital cannot be credited with any share on these monopoly surpluses. If then the cost of reproducing these machines is $100,000, and the prevailing rate is five per cent, then the capital value of these machines or the share of the social fund of capital embodied in them is represented by $100,000, and the earnings of this social fund or the interest *per se* is $5,000. For is it not clear that the $7,500 earned by these machines in excess of five per cent on the cost of reproducing them is due to some monopoly influence that inheres in the concrete machines or capital goods?

Answer may be made that after all this is only a question of definitions. I may define interest as the earnings of "the social fund of capital." Some one else may define it as the total earnings of "capital goods" capitalized at the prevailing rate, and so long as the some one else is consistent with himself in his use of the term, his position is as tenable as mine. Is this quite true? Interest has long found defenders on the ground that some abstinence or disutility is endured. While this truth has not always been clearly apprehended, it has nevertheless been persistent in our literature, and in the minds of most of us still serves to distinguish interest from those monopoly surpluses for which no economic justification is sought. Now, unless we are prepared to show the utter fallaciousness of this belief, we are not at liberty so to define interest as to

include under it the most offensive of monopoly surpluses.

There is yet another way of exposing the confusion of thought in the paper before us. Professor Clark has contented himself with showing that the rent of land may be converted into interest by this process of capitalization. We have just been following Dr. Fetter in his attempt to show that the income from any capital good, including land, may be so converted. But if this is true then why may not any incomes be converted into interest by the same simple device. Dr. Fetter is at least willing to follow his reasoning to its legitimate conclusion, for he writes on page 196 as follows: As the market expression of the all-pervading premium of present over future, interest may appear in connection with any gratifications whether they be yielded by natural or produced by material or *human*, by durable or perishable agents. Clearly, then, not only rent and profit, but net wages as well may be converted into interest by the simple process of capitalizing them at the prevailing rate. And so it comes about not only that the old distinctions of land, labor, entrepreneur and capital are found to be useless, but with them disappears all distinctions between rent, interest, profits, and wages since all may be converted into interest by a simple arithmetical process. It seems to me we have only to state Dr. Fetter's thesis in this bold way to realize that there must be some serious break in his reasoning.

Personally I cannot but feel that those who are working along this line have been betrayed into a *cul-de-sac*, and that all hope for further progress will depend upon a return to Professor Clark's fundamental distinction between capital goods and the social fund of capital. In

a word, any attempt to secure simplicity of statement by ignoring fundamental economic distinctions can only result, as in Dr. Fetter's paper, in elucidating the whole matter into a hopeless obscurity.

LINDLEY M. KEASBEY: The distinction between rent and interest, as I understand it, rests upon an antecedent distinction between two kinds of income-bearing goods, land and capital. But these terms are misleading; land, in last analysis, is mere area, and capital may be made to include all else, even "the original and indestructible powers of the soil," whatever they may be. The distinction, however, being fundamental, I would suggest we employ new terms. Suppose instead of land we say "generative goods" meaning thereby those goods which possess in themselves inherent powers of increase, or procreative power, if you will. Goods which do not possess such power we might then designate as "productive goods" simply, and understand by this what political economists understood by capital in the old sense.

Under the category of generative goods would come animals and plants, which, when brought into the proper connection with the so-called original and indestructible powers of the soil, yield an increase of animals and plants. Historically,—if a little eliptically speaking,—generative goods would then include domesticated animals and cultivated fields. Now the first characteristic of these generative goods is that they do not diminish in quantity during the productive process, that on the contrary, they put forth a physical increase. Furthermore,—and this is economically of the utmost importance,—since domesticated animals and cultivated fields are normally monopoly goods, and not freely reproduci-

ble by labor alone, their physical increase represents a corresponding increase in value. In this case physical increase and value increase coincide. The patriarchs of old were wont to reckon their wealth in the number of their flocks and herds, the landlords their wealth in the extent of their estates and the produce thereof. Of generative goods it may accordingly be said: when put through the productive process they increase in quantity and in value.

Of productive goods this is not the case. When productively employed they augment value as do the generative goods, but this increase of value is necessarily accompanied by a diminution in quantity. Of productive goods it may therefore be asserted: when put through the productive process they decrease in quantity and increase in value.

It is upon this distinction between generative and productive goods that the distinction between rent and interest really rests. Rent was the term originally employed to designate the income derived from generative goods. It was, as Professor Fetter says, the income of "a special social class," the patriarchs and landlords; it was the income derived from "natural agents," *i. e.*, livestock and land; it was the income from "wealth measured physically," since the physical increase in this case correspond to the increase in value. Later on, with the institution of exchange, the term interest came to be employed to designate the income derived from capital, or, in other words, from productive goods. It was the income of another, a new, "social class," made up of merchants and manufacturers; it was the income derived from "artificial agents," *i. e.*, productive goods, "produced material means of production;" it was the income measured economically in units of value, or in terms of money, simply because there was no other way to meas-

ure it; physically speaking there had been a decrease not an increase.

Hence, historically speaking, rent represents the income from generative goods, interest the income from productive goods. Logically, however, the distinction is not so sharp. True, the income from productive goods can not be expressed in terms of rent for there is no physical increase to measure in physical units representing value. On the other hand, the income from generative goods can perfectly well, nay perhaps better, or at least more conveniently, be expressed in terms of interest than in terms of rent. These generative goods put forth a physical and a value increase and such increase can be measured either in physical units (which then represent value units) or in value units alone, *i. e.*, in terms of money. Since the money expression is coming to be wide spread and is essentially more accurate and more convenient, we note the passing of the old rent concept, as Professor Fetter has said, and the general prevalence of the interest concept. Withal, the old distinction between land, *i. e.*, generative goods; and capital, *i. e.*, productive goods, remains and should be taken account of in all questions of rent and interest.

W. G. Langworthy Taylor: With respect to this particular part of the field of distribution, Professor Fetter proposes a triple classification: (1) valuation of goods; (2) rent as payment in kind; (3) interest as exchange of present for future goods at a money valuation. These stages are put forward as chronological and logical. As to (1) it seems to me to belong to a distinct category, that of values. This category does not chronologically precede the others, but runs parallel with them; it itself should be broken up into a series of stages, of which the lowest would be the cost of production period,

the second would be the period of equilibrium of utility with utility in a market, the third would be dominated by "price-determining" monopoly, until, fourthly, with the final disappearance of the element of cost, we may in the dim future come to a standstill with values determined by marginal utility *simpliciter*. The statement that subjective valuation belongs at the bottom of the ladder is the very reverse of the truth.

As to stages (2) and (3), Professor Fetter has been much more happy. Accepting the Clarkian theory that rent and interest are *allotropic* forms in distribution, he suggests that rent belongs to an earlier epoch, while interest characterizes the advanced period and the money (or set-off) economy. This distinction is interesting to me because it allows a "paralleling of this part of distribution with the genetic theory of valuation which I suggested above: rent belongs to an earlier, more materialistic stage of civilization than interest, undoubtedly; while the suggestion as to money is calculated to throw light on the function of money as a generalizer of values and a socializer of ecomonic life. Moreover, such generalization involves a decidedly higher intellectual and moral development of industrial man.

The old definitions of rent are criticised by Professor Fetter because they are partial, depend on social distinctions, and are confined to natural agents; because they deny the principle of cost of production to rent, distinguish rent from interest in a superficial sense, assume the indestructibility of a perpetual bearer, and follow a false theoretical lead which made a narrow technical term out of a broad usage of language.

The discussion arising from these attributes is certainly avoided by the new distinction between rent as the return in kind and interest as the return in money. But

it gives rise to newer and graver questions. I am inclined to admit the Clarkian allotropism; but that is posited on the supposition of a perfectly static society. As to a dynamic society Professor Clark has made no statement about rent, but we may assume that the allotropism would there be destroyed. It would there appear that land, as the scarcer factor, has a monopoly value not due to the calculations of the land-owner, and that while he is receiving a monopoly tribute which, of course, is a part of the market supply, the price is regulated by the produce on the marginal land continually brought into cultivation, so that rent is "price-determined," and that if he sells his land and buys industrials he will have to discount the expected fall of the one in terms of the other.

Evidently the proposed distinction does not take the dynamic movement into account; but tacitly assumes that what is true of the static society holds for the dynamic also.

Professor Fetter condemns the philosophy of Professor Marshall which seeks to trace a continuity between the concrete phenomena of rent and interest. As to this criticism it may be said in the first place that it is itself open to criticism, in that it admits validity in reasoning by contrasts alone, and denies it to reasoning by continuities. However, it is only by the latter method that abstract contrasts can be given life and be practically applied. The philosophy of Marshall has succeeded in this quest beyond parallel. The contention is, however, that there is no such distinction—that land is not monopolized, that it is perfectly mobile, that it involves expenses in every way like those in industry, etc. A very fair case of this sort may be made out so long as you retain the static point of view, but no

further; but Professor Fetter does not claim to confine himself to the static point of view, nor could he if he were to make a definition generally acceptable.

In the second place it may be charged that Professor Fetter, in his classifications (2) and (3) has really stated the very contrasts which Professor Marshall has logically united. The case of land rent remains typical of rent as a specific payment in produce, while Marshall analyzes the concrete conditions under which, step by step, such specific payments become socialized and generalized into a return *per cent* on a standard of value. Of course, Marshall's analysis does not set to itself the Clarkian task of an isolation of the static elements; it includes the dynamic elements in a practical way. And yet Marshall's purpose of reconciling the logical positions that Fetter himself has taken are severely condemned by the latter.

It is to be noted that the use of the term "rent" proposed is novel notwithstanding that it once existed. The Ricardian philosophy has driven it out of the Anglo-Saxon business world except in connection with land and its improvements. Does the scientific public desire a counter revolution?

I quite agree, however, as to the usefulness of the distinction defended by Professor Fetter when confined to its original hypothesis of the static state.

RICHARD T. ELY: I cannot help having the feeling that the Henry George agitation has carried some of our economists too far in their opposition to the Ricardian theory, just as the free silver agitation has pushed some of our economists to an extreme in their efforts to combat it. Economists have wished to take the bottom out from under the advocates of cheap money, and in

consequence in some cases have gone too far in their opposition to the quantity theory of money. It seems to me that even if they have done so unconsciously, some of our economists have allowed themselves to be forced to take an extreme position in opposition to the Ricardian theory of rent in order to remove the scientific foundation upon which Henry George endeavored to construct his theories. Naturally I cannot go into this matter to any length in the few minutes allowed me, but I want to attempt to call attention to a few points.

It is said that business usage makes no distinction between capital and land. Here we have to do with a question of fact. My own opinion is that business usage does make a marked distinction. At any rate I am sure that thoughtful business men do so, and that evidence of this can be found in the real estate columns of our daily press and in the business organs of real estate interest.

I have the feeling also that we have been pushed too far by the critics of the Ricardian phrase, "original indestructible powers of the soil," and that we underestimate the nature-factor in land. Perhaps it would be better to say "inseparable conditions of land." Abundant illustration is afforded of rent due to nature, and in cases which I have in mind, what nature offers may be regarded as original and indestructible. Take for example the land on which peaches are produced in the vicinity of Palisade, some ten miles east of Grand Junction, Col. Some of this land could not be bought now for a thousand dollars an acre. As I understand it, there is an abundance of land to the westward which is the same property so far as soil is concerned, but it has not the situation. If I am correctly informed this land upon which peaches are raised and which is of so high

a value is so situated that there are breezes which keep off the frost at critical periods. We have here an original indestructable gift of nature. Man cannot produce these conditions. Another illustration is afforded by the land on which grapes are produced in the western part of New York state. Lake Erie retards vegetation in the spring by absorbing heat until the danger of frost is passed, and in the fall by giving off heat, keeps away the frost until the grapes ripen. Here we have also an original indestructible gift of nature. The blue grass region of Kentucky would afford an illustration. The valley of the Mississippi, when contrasted with the rocky soil of New Hampshire, likewise affords an illustration of original indestructible properties of land.

The region in Colorado about Greeley affords a good illustration of gifts of nature which result in rent in the Ricardian sense. These are original and indestructible and strictly limited. They have value because they exist in smaller quantities than man desires. In the West we can also see the fact that an abundance of land is in use which pays no rent and which has been brought into use without any remuneration. The public ranges afford an illustration.

Now if there were time I should endeavor to show that the cases which I have cited are not to be regarded as exceptions to a rule, but they are fair illustrations of general principles.

Just one more point. I think Clark gives us a good suggestion concerning land when he speaks about capital as perpetual. Under the proper economic management the value of capital is perpetual. We can say the same thing in regard to the soil, even taking soil in the narrow sense of the term. Under modern agriculture, the fertility of the soil is maintained perpetually, while

at the same time it yields a return. I offer again as an illustration the country about Greeley, Col., where large and profitable crops of alfalfa are raised, which at the same time improve the fertility of the soil and prepare it for other and still more valuable crops.

JAMES EDWARD LEROSSIGNOL: I am glad that Professor Ely has called attention to the value of lands in the arid West, where problems of rent and interest are even more complicated than they are in the humid East. Desert land that cannot be irrigated is comparatively worthless. Land that is capable of economical irrigation has a considerable value before being improved. Land under a good ditch is worth from $25 to $1000 an acre.

In most cases there is a large surplus of value over and above the cost of the ditch and other necessary improvements. Frequently, however, the cost of improvement exceeds the value of the improved land, and the so-called rent is only a very low interest on a permanent investment of capital. Sometimes the cost of operating the ditch, or the cost of putting the water upon the land absorbs all the profits of farming, leaving only the barest wages to the farmer or compelling him to abandon the land.

Is it not correct to say that at least two kinds of returns are here involved—interest and profits on the capital invested in the irrigation ditch, and a surplus return of a different character, due to the natural scarcity of land and especially of water, and following the law of rent?

The annual use value of commodities permanently limited in quantity, such as old paintings, rare coins and land, is surely different from the annual use value

of commodities like houses, machinery or clothing, which are more or less freely reproducible. In the latter case we have equalization of profits and the law of interest —in the former a permanent differential following the law of rent.

So long as some goods are reproducible and others not, there must be a difference between interest and rent.

FRANKLIN H. GIDDINGS: There are certain important implications of that analysis of rent and interest put forth by Professor Clark and held in view throughout this discussion, which makes them practically identical quantities; rent being the sum total of differential gains accruing to concrete capital goods, and interest being the same income computed as a percentage on the total value of the same capital goods, conceived as a fund of "pure capital."

In the first place it is necessary to distinguish between an identity of quantities and an identity of categories. Identifying the sum total of rent with the sum total of interest does not identify rent and interest. The conception that we have to deal with is essentially mathematical, and can best be illustrated by the statistical distinction between the "mode" and the "average" of a column of figures. Two columns of wage rates may foot up to the same total. The average rate in each series may be the same, but one total may be made up of a few very high rates and many very low rates, while the other is made up of many medium rates—a difference of "mode." Rent is essentially a mode of income. Interest is essentially an average.

In the second place, identifying the sum total of rent with the sum total of interest does not involve an affir-

mation that rent enters into price if interest does. On the contrary, if interest enters into price rent does not, unless the sum total of cost enters into price twice.

In the third place, identifying the sum total of rent with the sum total of interest does compel us to identify capitalization with the social fund of capital, and we can escape the force of Dr. MacFarlane's criticism only by identifying the sum total of wealth with the sum total of capital. This identification I am convinced we we must make if Professor Clark's conception is to be accepted and to stand. We must include in the sum total of capital goods every iota of unconsumed material wealth, taking the ground that whatever can be capitalized is a concrete basis of pure capital. Absolutely every thing that the individual or the community owns and can utilize can be listed as an asset at some figure, however small, and as such, it contributes to the total fund of value, conceivable as pure capital. Either the whole conception which thus makes capital goods and pure capital opposite sides of the same shield must be abandoned, or the distinction between producer's goods and consumer's goods must be discarded.

WINTHROP M. DANIELS: I am inclined to accept without reservation all that the "arch-heretic," Dr. Fetter, has said, but will not attempt to do more than reply to certain of the issues raised by Dr. Carver. The latter broke a lance for the old axiom that rent enters into cost in a different way from wages and interest. Dr. Carver had contended that while wages and interest as personal incomes were necessary to evoke the labor and abstinence necessary for production, rent as a personal income was not necessary to call land into the service of production. This attempt at differentiation,

failed in two points: first, not all the wages now paid, nor all that is now paid in interest, is necessary to evoke the amount of labor and abstinence now undergone. The totality of wage and interest payments is in excess of the amount required as a stimulus to the present amount of labor exerted and abstinence endured. In the second place, without the expectation of rent (in the sense of a return for the use of so-called natural agents) the amount of land that would be furnished by the owners for productive purposes would be less than it now is. Without the expectation of a return called rent, most individuals would be unwilling to undergo the abstinence required to transform land area into economic land, the agent of production. Virtually wages, interest and rent (so-called) are alike in that the expectation of each is necessary to secure the marginal supplies of each respectively. I thoroughly agree with the theoretic identification of land and capital as proposed by Dr. Fetter.

Frank A. Fetter: All taking part in this discussion have shown their belief that economic theorizing is worth while, and that theories both good and bad are affected by, and in turn affect, practical life. In accordance with this view, the leading proposition of the opening paper that the conventional concepts of rent and interest are illogical and inconsistent, has a corollary that these concepts are unfitted to explain the problems of the business world, and that another conception must be adopted.

To the frank and friendly criticisms offered in this debate, I shall reply as brevity permits. Those taking part in the discussion may be arranged in a continuity classification (the validity of which I fully admit) from those who for regard of traditional theories would over-

look a lack of logic, to those who for regard of logic are willing to adopt new theories. The conservatives are far from harmonious in their beliefs, and by mutual cancellation they have left for consideration only a residuum of argument.[1]

The prime contention of the first part of my opening paper is not, as it was assumed by Professor Hollander to be, "the historical relativity of the traditional theories."[2] That thought is a minor one, and the brief historical paragraphs were given merely as "side lights" on the origin of the errors.[3] It would be an easy task to defend and strengthen these historical references had any one of the speakers sought to controvert them at any specific point. Even the critic who first waived the whole opening paper aside as "conjectural history" gave to the historical suggestions "conditional assent."[4]

Prejudgment has, I fear, caused more than one of my critics to shut his eyes to the repeatedly avowed purpose of the paper, which was to show that the traditional concepts are internally inconsistent, illogical, containing several conflicting thoughts, and that they were thus defective even in the days of Ricardo. In recognizing that some practical issues in Ricardo's time served to obscure this lack of logic, the paper had, to be sure, a suggestion of historical relativity. It is admitted by all the speakers that of recent years the emphasis on the various thoughts of these concepts has been shifted; and some would believe that this shift has cured the infirmities in logic. On the contrary I main-

[1] Brevity compels me to confine these closing comments to the criticisms adverse to the opening paper.

[2] See above, p. 204.

[3] See above, pp. 183–4.

[4] See Hollander, p. 204, 205.

tain that it has aggravated them. Thus, changes in industry and changes of thought have combined to enhance the difficulties *inherent from the first* in the older concepts.

Professor Carver has dissented generally from the negative part of the opening paper, regretting the attempt "to show that there is no basis for the scientific distinction."[1] He would explain the confusion by declaring that there are two clearly distinguishable concepts, the popular and the scientific, which at times contradict and overlap each other. As none of my critics attempted a specific disproof of this portion of my opening argument I may limit myself here to a reassertion that the so-called "scientific concept" is *inconsistent in itself*, that no writer has employed it without shifting thought and untenable conclusions. It is for the reader to determine whether I have not shown that the so-called "practical concept" has been confused with the so-called "scientific concept" in economists' minds. If this is true it follows that some of the supposed contrasts between rent and interest are but the reflection of the unconscious shifting in the subjective attitude of the thinker.

A test is thus afforded for any revision of the concepts; no valid contrast can be drawn between the concepts of rent and interest where there is an unconscious change from one to another of the three conceptions that have been noted. A shifting eclecticism becomes impossible when these different thoughts are clearly recognized. My critics, however, avoid a clear-cut decision, and uphold conceptions uniting two or more discordant elements. It is not easy, therefore, to say on just what

[1] See Carver, p. 203.

ground they take their stand. They defend in the main the attempt to distinguish between land and artificial agents objectively, but their reasons are largely drawn from supposed differences in the relation of the income to price, and yet according to their own statements this distinction is not co-extensive with that of the two objective classes of agents. Moreover, their arguments involve a use of the third distinction,[1] which they are endeavoring to overthrow.

This confusion may be seen in Professor Hollander's contention that the critics of the traditional distinction overlook "the composite character of the law of diminishing returns." He says that the characteristic that suffices to "differentiate land from capital as a productive good" is its diminishing efficiency in extensive cultivation; "while capital is available . . . . . in identical homogeneous quality with respect to extensive use." Observe the reasoning by which this conclusion is reached.[2] The assumption, however, that any particular enterpriser, in enlarging his business, is forced to take up poorer land, surely is not warranted. Except in the rare case that the particular enterpriser had been using the one best piece of land, he can hire more land as good as he has, or even better, if he cares to pay the prevailing rental, just as he can hire more and better machines. The thought evidently shifts to the old dynamic and social conception of the growing scarcity of land with increasing population, and from the particular entrepreneur to the personified total population.

There is another shift, for while the physical conception of land is retained, and it is thought of in terms of

[1] See above, p. 193.

[2] See above, passage beginning "No entrepreneur" and ending "only in inferior efficiency," p. 208.

acres, the particular produced goods called capital, are thought of in terms of a value unit. This creates the illusion that the differential return is peculiar to land, and that the value units of capital are of homogeneous quality. The varying yields of land are looked at in a way that makes them necessarily appear as differentials, and the varying yields of other agents are by reason of the mode of their capital expression, converted from differential incomes into homogeneous capitalized sums. What is this capital but the incomes (or I should call them rents) of productive goods, capitalized at the prevailing rate of interest? A given rent thus corresponds to one unit of capital, a double rent to two units of homogeneous capital, and a free good, or rentless unit, to no capital at all. This capitalization of rents is possible in the case of land also, the price of land being the sum of the anticipated future rents, discounted to their present worth; and the enterpriser can purchase x dollars' worth of land as easily as x dollars' worth of machines, and the units are just as homogeneous in one case as in the other. In fact, both kinds of agents frequently are bought as value units. The word "amount" in the contrast between an amount of land and an amount of capital begs the whole question, for in one case it means units measured by area and differing in yield, in the other it means the homogeneous value expression of differing units. It is impossible to escape these errors if the analysis insisted upon in the opening paper is overlooked.

Professor Carver has maintained[1] that there are abundant reasons for distinguishing between the income from land and the income from produced goods, in that in-

[1] See pp. 200–201.

terest as a personal income is a necessity to insure waiting, and thus is a condition of efficient production. This is retaining the traditional conception of the distinction between the objective classes of goods, while repudiating the traditional reasoning, and while broadening the conception of rent to any surplus or unearned income. The idea of surplus is generally very vague, but under the application of any suggested surplus-test the concept of rent would extend to numberless incomes and fractions of incomes not derived from land, and would fail to include numberless incomes and fractions of incomes that are derived from land in any usable sense of that term. Replies that, to my mind, are conclusive on the principle here involved were given in the course of the discussion.[1] It follows from this surplus conception that any portion of the income derived from produced goods that would have been saved if the rate of interest had been lower, is rent, not interest; and that any natural element of fertility in land that would have been used up except for the factor of waiting, would thereafter yield interest, not rent. Adopting for the moment the terminology of the critic, his challenge may be accepted; the proposition that "men must receive interest as a personal income to induce them [*i.e.*, the marginal abstainers] to wait" and that "interest as a personal income is necessary to secure efficient production," not only can be but must be paralleled by like propositions concerning rent. Men must receive land rent as a personal income to induce them to bring the marginal land into cultivation and to maintain undiminished the supply of productive

[1] See Daniels, p. 226. Dr. Whitaker's remarks to the same effect unfortunately were not obtainable for this report.

qualities. Thus land rent is necessary to secure efficient production continuously from land. The margin in question is not a hair line, it is in practice a zone of wide extent. This fact is the basis of private property in land as broadly and surely as the other fact is the justification of interest. We are not concerned here with the ethical question, but in each of the two cases a social policy is based on the need of maintaining the marginal units of supply, a policy which always appears unjustified when attention is directed only to the surplus cases.[1] It is in conflict with all experience to assume that the actual supply of land would be kept up to its efficiency if rent did not go to some personal agent who made himself responsible for the repairs, the restoration of fertility, and the waiting for the future involved in refraining from "Raubbau," the immediate exploitation of the land. (In some cases, it is true, this agent may be a group of men acting collectively through government, as in the case of any form of public ownership).

As Marshall says: "The greater part of the soil in old countries . . . . has in it a large element of capital. Man can turn a barren into a very fertile soil." [2] To deny first that the supply of land either as extension or fertility has any marginal relation to sacrifice, or is within man's control, and then when this is shown to be an error, to assert that such land is not land, but capital, and that the income from it is not rent, but interest—this is the approved mode of showing the exceptional character of rent. Are the terms land and rent thus to be refined away from any relation to the real

[1] This applies also in answer to the remarks of Professor Ely.

[2] Marshall, Principles of economics, 4th edition, p. 224. He does not draw the conclusion, however, that is here suggested as necessary.

things about which the economist begins to reason, and of which the practical world thinks whenever those terms are used? [1]

Professor Taylor admits that my thesis is valid when confined to static conditions, but he adheres to "the relation-to-cost" concept in discussing dynamic conditions.[2] In his very suggestive remarks he has not revealed his thought fully enough to make clear the ground of his reasoning, but it would appear to be essentially the one just examined. While Taylor and Carver differ in some points, they agree in others, both alike rejecting the static reasoning on which Hollander bases his conclusion.

Dr. MacFarlane also holds a relation-to-cost concept of rent, but most of his discussion is given to a negative criticism of my position. His own views, though known to many readers, were not developed in this symposium. Some points will be noted below.

The attacks on my positive proposals refer in part to their supposed implications and consequences, in part to the advisability of the terms suggested.

1. Professor Taylor objects[3] that the first of the three stages in the analysis of value is not fundamental and precedent to the others, but is co-extensive with them. This criticism probably proceeds from a misunderstanding of the briefly expressed proposition. Not all goods, but only *immediately enjoyable* goods were said to present the first problem in the analysis of value. The second problem, that of the value of usufructs, and the third,

[1] The interesting facts cited by Professor LeRossignol, p. 224, seem to me to illustrate, not to disprove, the view I have taken, which is far from a denial of the "surplus return" to the investor in land, or in other wealth, in a new country.

[2] See Taylor, p. 221.

[3] See Taylor, p. 218.

that of the value of future uses, are, as my critic suggests, but developed phases of the general problem of value.

2. Professor Taylor believes that in criticizing Marshall's attempt to trace a continuity between rent and interest, I have denied the validity of reasoning by continuities. [1] It is not to a true continuity concept that I object, but to a pseudo-continuity concept. As the thought passes along the series from rent as an income yielded by one kind of concrete goods, to interest as the income yielded by another kind, there is unconsciously introduced a new contrast. The value expression of capital and the percentage expression of interest are equally applicable to the rent end of the series, and it is an error to assume that they are applicable only at the other end. My suggestion is to apply consistently each distinction in turn.

3. Dr. MacFarlane declares[2] that the outcome of my proposal is the obliteration of all distinctions between rent, interest, profit and wages. This conclusion, drawn from my statement that "interest may appear in connection with any gratification," is due to the failure to apprehend how and how far the proposed conception differs from the one apparently taken in this discussion[3] by the critic himself, that each kind of income corresponds to a particular kind of income bearer. The proposal is to look upon interest in all cases (as it is now in many cases) as being that particular phase of value connected with differences in the time of accrual of incomes. Recognizing that a day's work to-day is worth more

[1] See Taylor, p. 220.

[2] See p. 215.

[3] As is well known to students of economic theory Dr. MacFarlane has in his work "Value and distribution," obliterated the distinctions between the objective classes of agents yielding rents, and other incomes, more fully than has any other writer.

than one next year, does not identify interest and wages. Wages payable at different points of time vary in value as do rents at different points of time, and the comparison of each series is expressed by the interest rate.

4. Dr. MacFarlane objects[1] further that the proposed view of capital identifies the capitalized value of monopoly surplus with capital in general. True it does; there is no other logical way.[2] It is not quite clear what monopoly means as the critic uses the term, but any source of income that is continuing and forseeable can be capitalized and sold, and thus becomes homogeneous with the value of the continued control of other sources of income. When from any cause income ceases, the capitalization collapses, monopoly or no monopoly. The puzzle as to whether the $5,000 or the $12,000 are to be called interest, is merely a confusion of the problems of economic income and contract interest.

5. Dr. MacFarlane says[3] that I have tried to identify land and capital by a mere arithmetic device that does not touch the substantial differences. I would reply that because an arithmetic device has been inconsistently applied in the traditional theory, illusive contrasts not existing objectively, have been created. I dissent from Professor Carver's opinion that it is merely a question of terminology in dispute,[4] and I agree with Dr. MacFarlane that there is involved more than a question of definition.[5] The arithmetic device is significant at least in a negative criticism of the supposed contrast between rent as a differential and interest as a homogeneous income; it serves to show the fallacy in the old view as to the spe-

[1] See pp. 213–14.
[2] See Professor Gidding's reply, p. 226.
[3] See p. 212.
[4] See p. 203–4.
[5] See p. 214.

cial relation of rent to entrepreneur's cost of production; and it sets in a clear light the error in the traditional contrast between the value expression of "capital" and the concrete expression of land. This proof of the substantial unity and continuity of the body of income yielding wealth has been suggestively styled by Professor Taylor[1] in a phrase drawn from chemistry, "allotropism." One group of elements has been mistaken under differing conditions for two elements, (the condition in this case being the subjective attitude of the thinker). Take away the fallacious contrast, apply the arithmetic device consistently, and the objective classes of "natural agents" and "capital goods" are seen to be merged into one body of wealth, presenting three value aspects: gratifications, usufructs, expectations. But identifying the substance does not identify the allotropic states; coal is not diamond, though both are allotropic states of carbon; and no more is rent the same as interest. Like most analogies, however, this one is not perfect, and may become misleading. But this has brought us to another question deserving special answer.

6. It is taken for granted that my proposition is to treat rent and interest as identical. Several of the speakers have assumed that the idea of the paper was that of John B. Clark, and thereupon they have criticized his views, not mine. My indebtedness (shared in common with all contemporary students) to the inspiration of this ablest of theoretical economists, should not impose on him any responsibility for the theory of distribution here presented. The prepossessions of some of the speakers make it difficult for them to see the full import of a denial of the parallelism between the two incomes, rent and interest on the one hand, and the two objective

[1] See p. 219.

classes of goods, land and capital on the other. They therefore attribute to me conclusions deduced from premises of their own supplying. This is seen in the assumption that a denial of the conventional contrasts between valuable natural agents and (conventional) capital is a denial of the difference between rent and interest. It is consistent with my view to speak, as Professor Daniels does, of the identification (or merging), of the classes of wealth composing "land and capital" (in the conventional sense); but this is not an identification, as others consider it to be, of rent and interest. Having made this point as clear as I could in the limited space allotted, I can merely re-assert that this lack of parallelism is of the very essence of the contention in the opening paper.

7. Finally, it is said[1] that if the old concepts are to be rejected, it is better to devise new terms than to adapt old ones having misleading associations. To this view must be conceded a large measure of validity. Regarding the term rent there is less difficulty, as the broad meaning here suggested not only has strong historical support, but in many languages, including our own, is grounded so deeply in popular usage that no economic authority has been able to uproot it. There is needed only an elimination of inconsistent thoughts from the concept and the retention of one of the ideas that always has been present in it. Regarding interest the decision is more difficult. Only yesterday economists talked of "the theory of profits" when they meant what is now called "the theory of interest." The term interest, until recently, was used almost if not quite exclusively, as meaning the income from a money loan. This is a contractual, not an economic income, and as

[1] Hollander, p. 209.

such is not a genus coördinate with economic rent, rather it is species of the genus contractual rent. Is it not significant that even in the classical treatment interest as an accruing or realized income expressed as a percentage never appears except as the result of a contract?

The essence of the so-called problem of interest, according to the view in the opening paper is not fundamentally contractual interest, but capitalization. The problem logically following that of rent is not that of analyzing a coördinate income, for rent absorbs all the incomes accruing from material agents at any moment of time; but it is that of the value-calculation on future incomes. The title of the opening paper might perhaps better be: "The relations between rent and capitalization." That, however, would have misled the reader approaching it with the older conceptions in mind. Either "the theory of discount" or "the theory of capitalization" would be a more appropriate term for this part of the problem than is the theory of interest, and possibly some still better term can be found. The final use of terms is a matter of social convention; but when the real nature of the problem is understood, and then the fitting terms are suggested, they will not long fail of acceptance, as the example of the rapid change in the usage of the word profits gives reason to hope.

Whatever other impression may be left by this discussion I trust it will not be that I have contended for a merely verbal change. On the contrary I have outlined, whatever be its defects, a radically new conception of the whole theoretical analysis of distribution. Doubtless this session has been most profitably spent in considering the more negative phases of the subject; but

the scant attention that has been given to the yet more important positive outcome of the study may leave an impression of negation and verbal criticism that is misleading.

I welcome the able, forcible and somewhat unexpected support that has been given to my thesis in this discussion by the advocates of a realistic theory.[1] Opinion on this subject is unquestionably in process of change. Even the more conservative speakers in this session have made concessions that would have been startling a few years ago. The immediate result of such a friendly interchange of views as this has been, may be to strengthen each in his own opinion; but in the end the result must be to help us all towards the right solution of these difficult and important problems in the realm of abstract economic theory.

[1] Daniels, Giddings, Marburg, Whitaker. Unfortunately no report was secured of Mr. Marburg's brief and pointed remarks or of Dr. Whitaker's subtle discussion. Professor Keasbey's attitude toward the question is favorable to the opening paper as against its critics, but his point of view is original, and his treatment in several ways not consistent with the views I have expressed.

INDEX

Adams, Henry C., 60.
Address of welcome on "The value of Southern idealism," by Edwin A. Alderman, 74.
Agriculture, negro's effect on, 122; progress of Southern, 119; recent development of Southern, 125.
Agricultural outlook, general Southern, 119.
American Economic Association, general, 1–2; constitution, 3; objects, 3; membership, 1–3; honorary members, 3; officers, 4; council, 4; by-laws, 5; meetings, 1; publications, 1.
Alderman, Edwin A., address of welcome on "The value of Southern idealism," 74.
Anderson, James, 205.
Artificial agents, 180
Bagehot, Walter, 204.
Balfour, A. J., 54.
Barter, 51.
Barter economy, 194.
Beet sugar, 97.
Böhm-Bawerk, 176, 188, 189, 195.
Boll weevil, 113, 159; damage caused by, 115; habits of, 114; progress of, in Texas, 114; prospects for overcoming, 110, 117. See *map*.
Breaux, S. Locke, discussion on "Rice," 110.
Bullock, C. J., 179.
By-laws of Amer. Econ. Ass'n., 5.
Cairnes, 54.
Canard, 65.
Cane sugar, introduction of, 81.
Cannan, Edwin, 62.
Capital aspect, 193–5.
Capital, social fund of, 214.
Capital value, 210–212.
Capital and land, business man's distinction between, 222–224.
Capital goods, 182, 211, 214, 226, 237.
Capitalization, 196, 197, 209, 210, 226, 239
Carnegie Institute, 45.
Carlyle, 57, 58.
Carver, Thomas N., discussion, 199; 226, 229, 231, 234, 236.
Civil war, effect on cotton industry, 146; sugar industry, 81, 99; effect on Southern industry, 163; South's slow recovery from, 121.
Clarification of sugar, 89.
Clark, John B., 182, 191, 203, 206, 207, 210, 211, 215, 219, 220, 226, 237.
Climate, effect on tobacco, 136.
Committees, standing, 6, 43.
Constitution of the Amer. Econ. Assn., 3.
Cost of production, 180, 190, 192, 200, 218, 219; relation to rent and interest, 180, 234.
Cost, marginal, 53.
Cotton, boll weevil; future of, 126, 160; history of in U.S., 144; see *boll weevil*.
"Cotton and the general agricultural outlook," paper on by D. F. Houston, 113-122; discussion by Geo. K. Holmes, 122; William C. Stubbs, 128.
Cotton gin, 149, 150, 152; effect of, 162.
"Cotton industry," paper on by D. A. Tompkins, 144; discussion by C. C. Thach, 154.
Cotton industry, effect of Civil war, 146; importance to South, 154; manufactures in South, 159; present situation of, 150
Cotton production, outside boll weevil district, 117; effect of slave labor on, 148; and price by years since 1790 (table), 147.
Cotton seed, utilization of, 164; value of products of, 158.
Council meeting, 41; members of, 8–11; recommendations of Executive Committee, 42.
Cultivation of sugar, 86.
Daniels, W. M., discussion, 226; 232, 238, 240.
Definition, incompleteness of definition of rent and interest, 177.
Diffusion, extraction of sugar juice by, 88.
Diminishing returns, 206–8, 230.
Distinctions between rent and in-

terest by class ownership 178, 187; by natural and artificial agents, 180; incapable of application 193, still to be maintained, 209, 235, 238; by relation to cost, 180, 190, 200, 212; by physical or value expression of agents, the wealth and capital aspects of goods, 181, 193–6; useful when confined to static state, 221, 234; conflicting distinctions, 185, 186; by generative and productive goods, 216; 231.
Distribution, outlines of Fetter's theory, stated, 196; functional, 201; system presented by MacFarlane, 192.
Domestic trade, 54, 55.
Durham, city of, 143.
Durable goods, 193, 194, 215.
Durability of rent and interest bearers, 182.
Dymond, John, discussion on "Sugar," 99.
Eastern markets, importance to cotton producer and to South, 152.
Economic Association. See American Economic Association.
Economic history, 183, 184, 194.
Edmonds, Richard H., paper on "Utilization of Southern wastes," 162.
Ely, R. T., discussion, 221; 233.
Emigration from South, 148.
Ethics, 50.
Exchange, 51.
Fertilizers, use of, in South, 158.
Fetter, Frank A., Secretary's report, 41; treasurer's report, 44; paper on "Rent and Interest," 176–198; discussion, 227–240.
Finance, public. See *Taxation*.
Fisher, Irving, 176.
Forestry, movement toward scientific, 168.
Generative goods, 216–8.
George, Henry, 221, 222.
Giddings, F. H., discussion, 225; 236, 240.
Glasson, William H., discussion on "Tobacco," 142.
Graining sugar, 90.
Granulation of sugar, 91.
Held, Adolph, 179.
Hill, 206.
Historical condition as occasioning the original confusion as to the nature of rent and interest, 183, 228.
History of cotton industry in U. S., 144.
Hobson, John A., 191, 192, 206.
Hollander, J. H., discussion, 204; 228, 230, 234.
Holmes, Geo. K., discussion on "Cotton and the general agricultural outlook," 122.
Houston, D. F., paper on "Cotton and the general agricultural outlook," 113.
Hume, 205.
Improved agents, 179, 180.
Incidence of taxation, 63, 65–8.
Indestructible powers, 222, 223.
Industrialism, Southern, 75.
Inhabitants, South's need of, 175.
International trade, 54, 55.
Interest, as an average, 225; contract, 183, 184, 185; imperfect definition, 177; a percentage, 184, 186, 202, 203; propositions concerning, 201; rate, how fixed, 212.
Johnson, Alvin S., 178, 206.
Juice, extraction of sugar, 87; by pressure, 87; by diffusion, 88.
Killebrew, J. B., discussion on "Tobacco," 135.
Knapp, S. A., paper on "Rice," 102.
Keasbey, Lindley M., discussion, 216; 240.
Labor, 57.
Labor, deterioration of negro, 123.
Land and capital, distinction in business said to be impossible, 189; said to be made, 222–4.
LeRossignol, J. E., discussion, 224; 234.
Lumbering, 166.
MacFarlane, C. W., discussion, 209; 192, 206, 226, 234, 236.
Malthus, R., 180, 205.
Map showing boll weevil district in Texas, 115.
Marburg, Theodore, 240.
Marginal utility, 219.
Marshall, Alfred, 176, 179, 181, 190, 207, 220, 233, 235.
McCulloch, J. R., 62, 206
Meeting, sixteenth annual, 38.
Members, list of, 12–36; summaries of, 37; changes in, 43.
Migrations of negro, 123.
Mill, J. S., 54.

Milling of rice, 106.
Mississippi River, attempts to check overflows of, 85.
Mississippi River Commission, 85
Molasses, 91, 92; mixing and bleaching, 96; from open kettle factories, 93; how different from syrup, 94.
Money economy, 194.
Monopoly, price determining, 219.
Natural agents, 180, 188, 190; 237.
Negro, 76; effect on Southern agriculture, 122.
Negro labor, 123, 157, 160; migrations to city, 123.
Officers, election of, 46; for year 1904, 7.
Open kettle factories, 92.
Packing industry, 165.
Packing sugar, 95.
Perique tobacco, 140.
Perishable agents, 215.
Positive solution of the theoretical problemof rent and interest, 193.
Popular concept of rent, 202, 203.
Preparation of rice for food, 107.
Pressure, extraction of sugar juice by, 87.
Presidential Address, on "Social aspects of economic law," by Edwin R. A. Seligman, 49.
Produced agents, 188.
Productive goods, 216, 217, 218.
Progress, in South, 170; of Southern agriculture, 119.
Program, 38.
Property, private, 55, 56, 57.
Quasi-rents, 181.
Racial integrity, 76.
Railroads, effect on South, 124
Recommendations of Executive Committee to Council, 42.
Rent and interest not to be distinguished by difference in agents yielding, 194; as successive stages in the analysis of value, 195; relativity of concept, 205; see *distinctions*.
Rent, an absolute amount, 184, 186; imperfect definitions, 177; development of "popular concept," 202, 203; development of "technical concept," 199–202, 203, 229; contract, 183, 184, 185; a "mode," 225; return in kind, 219; summary of essentials of, 185, 186.
Reproducible goods, 225.
Resolution, 47.
Retrogression in the South, 171.
Ricardo, David, 54, 64. 179, 180, 183, 184, 189, 196, 205, 222, 228.
"Rice," paper on, by S. A. Knapp, 102; discussion by S. Locke Breaux, 110.
Rice, economic production of. 107; errors of preparation and distribution, 106; future of, 112; as a human force, 105; industry, present status of, 102; sale of, 108; injury through system of toll milling, 110; remedy for system toll milling, 111; a future staple crop, 103; time and labor necessary to produce, 107.
Secretary, report for 1903, 41.
Seligman, Edwin R. A., Presidential address on "Social aspects of economic law," 49.
Shelfer, Lawson H., paper on "Tobacco," 129.
Single tax, 190.
"Sirop de batterie," 94.
Smith, Adam, 55; his principle of economic progress, 51; 64, 179, 180, 205.
Slave labor, 153; advantage to South, 155; effect on cotton production, 148; efficiency of, 155, 156.
"Social aspects of economic law," presidential address by Edwin R A. Seligman, 49.
Social class, 178, 185, 187.
Social fund of capital, 226.
Soil, effect on tobacco, 139, 140.
Solution of the inconsistencies between rent and interest, 187, 188, 190–2, 193, 194, 195, 219.
String sugars, 92.
Stubbs, William C., paper on "Sugar," 79; discussion on "Cotton and the general agricultural outlook," 128.
"Sugar," paper on, by William C. Stubbs, 79; discussion by John Dymond, 99.
Sugar, clarification of, 89; cultivation of, 86; grades of, 94, 95; graining, 90; granulation, 91; obstacles to production, 84; output, 84; how packed, 95; preparation of grounds for, 86; time of planting, 87; influence of tariff on, 85; extraction of juice, see *juice*.
Sugar beets, extraction of juice, 88.

Sugar cane, 86; propagation of, 86; prospects, 96; seedlings, 83.
Sugar industry after the Civil war, 99; influence of Civil war on, 81; development of, 79
Syrup, how different from molasses, 94.
Table, showing production and price of cotton since 1790, 147.
Tariff, influence on sugar industry, 85.
Taxation, 58–70; absorption theory, 66; conclusions, 70, 72; justice in, 61; personal property, 67–8; shifting and incidence, 63, 65, 66.
Taxes, on real and personal property, 68.
Taylor, W. G. L., discussion, 218; 234, 235, 237.
Technical concept of rent, 199–202, 229.
Textile schools, 159.
Thach, C. C., discussion on "Cotton Industry," 154.
Time, as the basis of distinction between rent and interest, 196.
"Tobacco," paper on by Lawson H. Shelfer, 129; discussion by J. B. Killebrew, 135; William H. Glasson, 142.
Tobacco, climate's effect on, 130, 136; commercial values, 133; handling, 132; Perique, 140; soil's effect on, 136, 139, 140; species of, 135; taxes on, 142; theory of growing yellow tobacco, 137; variability of species, 136; yellow variety, 136; white burley variety, 138.
Tooke, 206.
Toll milling of rice, 110; remedy for evils of, 111.
Tompkins, D. A., paper on the "Cotton Industry," 144.
Torrens, 206.
Treasurer's report, 44.
Turgot, 57.
Turpentine, 167.
Utility, 219; marginal, 53, 54.
"Utilization of Southern wastes," paper on, by Richard H. Edmonds, 162.
Value, 53.
Wages, necessary to induce labor, 200; not so in some cases, 226, 227.
Walker, F. A., 179.
Wastes, utilization of Southern, 162.
Water power, utilization of, 169.
Wealth aspect, 193, 194, 195.
West, 205.
Whitaker, A. C., 232, 240.
White burley tobacco, 138.
White labor, supplementing negro labor in cotton fields, 124; change from negro to, 157.
Yellow tobacco, 136; theory of growing, 137.

PUBLICATIONS

OF THE

AMERICAN ECONOMIC ASSOCIATION

THIRD SERIES. ISSUED QUARTERLY.
VOL. V, NO. 2. PRICE, $4.00 PER YEAR.

PAPERS AND PROCEEDINGS

OF THE

SIXTEENTH ANNUAL MEETING

PART II

NEW ORLEANS, LA.

DECEMBER 29–31, 1903

MAY, 1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON: SWAN SONNENSCHEIN & CO.

Copyright, 1904, by
American Economic Association

PRESS OF
ANDRUS & CHURCH
ITHACA, N. Y.

CONTENTS

PAGE

THE MANAGEMENT OF THE SURPLUS RESERVE. By Edward S. Meade, University of Pennsylvania 1

DISCUSSION: John H. Gray, Northwestern University 17

Victor Rosewater, Omaha, Neb. 23

Henry Rand Hatfield, Chicago University 28

THE THEORY OF LOAN CREDIT IN RELATION TO CORPORATION ECONOMICS. By J. Pease Norton, Yale University 34

DISCUSSION: Frederick A. Cleveland, New York University 57

STATE TAXATION OF INTERSTATE COMMERCE. By Frank J. Goodnow, Columbia University 63

DISCUSSION: Winthrop M. Daniels, Princeton University 86

Frederick N. Judson, St. Louis, Mo. 86

Carl C. Plehn, University of California 89

TRUSTS. By Henry C. Adams, University of Michigan 91

DISCUSSION: Balthaser H. Meyer, University of Wisconsin 108

James Edward Le Rossignol, Univ. of Denver 113

Edward W. Bemis, Cleveland, O. 117

Maurice H. Robinson, University of Illinois 123

W. G. L. Taylor, University of Nebraska 130

Jacob H. Hollander, John Hopkins University 131

Thomas N. Carver, Harvard University 132

H. W. Farnum, Yale University, (summary of discussion) 132

A THEORY OF SOCIAL CAUSATION. By Franklin H. Giddings, Columbia University 139

DISCUSSION: Albion W. Small, Chicago University 175

Charles Horton Cooley, University of Michigan 182

Lester F. Ward, Smithsonian Institute 187

George L. Burr, Cornell University 190

Willis Mason West, University of Minnesota 193

Franklin H. Giddings, (closing discussion) 199

TABLE OF CASES 200

INDEX 203

THE MANAGEMENT OF THE SURPLUS RESERVE

EDWARD S. MEADE

The surplus reserve of a corporation is the amount by which assets exceed liabilities. It consists of the accumulation of the amounts remaining out of income after fixed charges and dividends have been paid. The surplus is represented as a debit on the profit and loss account, and as a liability on the balance sheet. The purpose of its accumulation is either to guarantee the payment of interest and dividends, or because stockholders believe that the money which might otherwise be distributed among them will yield a larger return if left in the business of their company than in any other form of investment which is open to them. The profits of any business, unless it be the receipts of some public service corporations, are subject to wide fluctuations. The requirements for interest are constant, and the rate of dividend, if a corporation desires an investment position for its stocks, should never move except to increase. Out of this situation, arises the necessity of establishing the lowest point on the curve of profits as the maximum of distribution, and of employing the surplus over this amount, low in some years and high in others, in such a way as to add to the income.

The proportion of annual profits which should be reserved for the surplus by any given concern depends upon the regularity of the demand for the product. A railroad, for example, can pay out a higher percentage of the profits of prosperous years than can a steel manufacturing or a shipping concern. In other words, the liability item on the balance sheet of a steel manu-

facturing corporation which is called surplus, should bear a larger proportion to the sum of the liabilities than in the accounts of a railroad. It will finally be conceded that a company which is organized on a speculative basis and whose stock contains an excessive amount of water, should reserve a larger proportion of earnings than a company which is firmly established in the confidence of investors.

These principles of financial management are thoroughly understood and generally accepted by those who administer the finances of business concerns. Even when the necessity of making a market for speculative stocks compels the payment of the entire amount of profits to stockholders, the policy is sincerely regretted by those who adopt it and who usually sell their own holdings at an early date, thus manifesting, in a practical manner, their disapproval. There are, however, certain variations and applications of these principles which will repay investigation. We may consider the following problems which concern the management of the surplus reserve. First, the various forms in which the reserve may be invested; second, the apportionment of capital expenditures between earnings and the proceeds of capital sales; third, the relation of maintenance expenses to the surplus; and fourth, the methods by which the surplus is distributed to stockholders.

The ordinary form of the reserve is an investment in plant and equipment. It is rightly believed that money turned back into a going concern, especially when the demand for its products is increasing, will bring a larger return than when held in securities. It may be questioned, however, whether a portion of these reserves could not be invested to greater permanent advantage in securities which bear no reference to the business in

which the concern is engaged. In other words, may there not be an advantage to those enterprises whose earnings are most subject to fluctuations in building up out of earnings, reserves of good securities, from which they may draw at all times a steady income which no reverses of business can disturb, and which will enable their managers to operate at cost or below cost, if such a policy is necessary to maintain their market position and to keep their plants in operation? For many years the directors of the Pennsylvania Coal Company pursued this policy and placed all of their earnings above a moderate dividend in outside investments with the result that they were eventually able to pay their dividends without reference to their coal business. The great shipping companies of England and Germany follow a similar course, and place a large portion of their surplus earnings in outside securities. It is claimed that the Cunard Company, for example, might lose all its ships and still have 37 per cent of their book value remaining. A reserve of securities may also be drawn upon during a period of depression to maintain the dividend rate. This practice is general among shipping companies. If the surplus reserve is to be regarded as a fund laid aside for a rainy day, this practice may be approved. If, however, the surplus is looked upon as an integral part of the business equipment, and this seems to be a more accurate conception of its place in the corporate economy, than the payment of dividends out of surplus is to be condemned. The only surplus which is available for dividends is a surplus of earnings. In other words, a dividend should never be paid unless it has been earned in the year in which it is declared.

Aside from the stability which outside investment tends to introduce into the profits of a business, it is an

aid to credit. The time comes to every concern when the banks must be appealed to for funds, either to anticipate the sale of securities, or to advance the proceeds of bills receivable which a financial stringency has made it inadvisable to press for payment. This money can usually be borrowed on the credit of a going concern without special security. The obligation created is termed a floating or unsecured debt, as distinguished from a debt secured by lien on specific pieces of property. Other corporations, for example the Consolidated Lake Superior, in 1902, or the Philadelphia and Reading in 1892, unable to obtain money in return for their unsecured promises to pay, were forced to deposit a "sufficient" amount of collateral with the lender to secure the loan. The margin of security demanded is sometimes exorbitantly large. For example, the Philadelphia and Reading to secure a loan of $2,000,000 was forced to deposit $12,000,000 of collateral, most of which was worth its face value. The Consolidated Lake Superior Company more recently pledged all of its assets, representing the expenditure of approximately $28,000,000 to secure a loan of $5,050,000, and these were bought in by the lending syndicate for $4,500,000. In either case, whether collateral is deposited, or whether the credit of the corporation is utilized, the existence of an unfunded debt which will mature within a few months, is a menace to the solvency of the borrowing corporation. Under some conditions of the money market, as witness the bankruptcy of Reading, Erie, Atchison, and Norfolk and Western, it is impossible to secure an extension of these loans, and the corporation is forced into a receivership or is shorn of its assets by the sale of securities which represent them. The creation of floating debt, an almost universal feature of corporation finance, has

been frequently followed by these disastrous consequences.

If temporary loans could be made, on specific security, which did not represent assets indispensable to the borrower, a large use of credit would be much less dangerous than it is at present. In view of this fact would it not be wise for corporations to invest a portion of their annual profits in good securities? From these they might at all times derive at least four per cent and could also use them to raise money, when need arises, either by selling these holdings or by depositing them as collateral for loans. The collateral could be sold, if the borrowing corporation was unable to meet its obligations, without impairing the efficiency of the business. This plan has not yet in any large measure been adopted. It is true that American railway corporations are turning into finance companies. The Pennsylvania Railroad, for example, holds securities which stand on its balance sheet at a valuation of $225,000,000, and the New York Central and Union Pacific also own vast amounts of securities. None of these treasury assets, however, can safely be used as collateral for loans. They could not be sold without impairing the integrity of the system. They are not, in other words, "free assets." They were not purchased for investment but for influence and control.

This question of investing surplus in "free assets" is hardly as important for the railroads as for the industrials. Some of these companies have accumulated large floating debts without special security and which if not carefully managed may result in receiverships. Would it not be wise, therefore, to repeat, that companies the nature of whose business forces them to frequently apply to the banks, should accumulate a fund

of quick assets which may either render borrowing unnecessary, or if it is resorted to, may protect the borrowing corporation from serious embarrassment in case its loans are called at a time when funds are low.

The principles governing the amount of cash working capital which a concern should carry, and which is usually, after the initial subscription, provided out of earnings, are generally understood. The amount varies with the volume of the business, the conditions of raw material supply, the regularity of the demand for the product, and the customs which regulate payment. A railroad needs but a small working capital. A steel manufacturing corporation requires that a large amount of cash assets shall constantly be available.

We are particularly concerned in this discussion with the disposition of the cash balance. The cash capital of a large corporation is not at all times fully employed in the business. In order to make these cash balances productive, they are either invested in call loans or in bank deposits on which a small rate of interest is paid. In recent years a custom has grown up that bank officers should become directors in large corporations, with a view to mutual advantage. In return for preference loans when occasion requires, in anticipation of bond sales, for example, the corporation deposits its surplus cash in the banks with which it is thus informally connected, receiving a low rate of interest. There are a number of banks and trust companies in Philadelphia which are known as Pennsylvania Railroad institutions, since their officers are directors of that corporation. These arrangements are mutually profitable, and are increasingly common.

It may, however, be suggested that the arrangement would be more profitable to the corporation directors, if

they were stockholders in the banks which make such large profits by lending out their deposits. Certainly dividends of 10 to 30 per cent, which are often earned by the large institutions, would be an acceptable addition to the small interest which large corporations receive on their cash deposited. We may go even further. Since it is admitted that a corporation should carry on its balance sheet a considerable amount of "free" assets, the most profitable investment for these funds, profitable not merely from the direct return, in dividends, but from the more direct control over large cash resources which this ownership gives, would be large holdings of bank and trust company stock.

It may be objected that the deposits of the community should not be jeopardized by such intimate connection with the interests of large corporations, but to this the answer is that the connection now exists, that the depositor has not frequently suffered, and that if corporations were recognized as the principal owners of banks, not merely would the force of public opinion be brought more directly to bear in forcing them to exercise due caution in their management, but the depositors would be fully informed as to the control of their deposits.

We have in the second place to consider the division of betterment expenses between profits and the proceeds of capital sales. Mr. Stephen Little, to the value of whose labors in creating a body of scientific knowledge in the field of accountancy no tribute can be too high, is to be credited with the first authoritative statement of the principle which applies in such cases, although the practice of many corporations had been conformed to the rule of policy which he laid down. In 1896, in a report of the financial condition of the Baltimore and Ohio Railroad Company, Mr. Little claims that no ex-

penditures should be charged to capital account, which did not result in an immediate or, at any rate, an early increase of income. By this he did not, of course, mean that railway earnings, no matter how prudent the policy of management, would not suffer periodical declines, but that in each particular case where money was to be spent for improvement, the character of the improvement should determine the source from which the funds should be provided. This portion of Mr. Little's report was not well received. The policy which he advocated was held to be impracticable and even absurd. A leading financial journal went so far as to say that an attempt to put this policy into operation would compel all improvements to be made out of earnings, since the profitableness of no expenditure could be assured in advance. Mr. Little lived long enough, however, to see his principle accepted as the settled practice, if not the avowed policy of American railroads.

Poor's Manual supplies us with a striking illustration of the method of its application: From 1898 to 1902, railway mileage in the United States, including second track in the estimate increased 29,000 miles, equipment increased 4880 locomotives and 219,142 cars, and terminals, yards and the other portions of the railway plant increased in proportion. The cost of road and equipment representing approximately the improvement charges to capital account, increased $609,407,791, and the total surplus during these five years was $375,678,615. If the amounts reserved out of earnings for so-called extraordinary expenditures be added to this accumulated surplus, for this purpose since 1898, the total amount expended on the railway plant out of railway earnings, we are safe in saying, largely exceeds the amount raised for this purpose by the sale of stock and

bonds. The cost of that portion of the increase of railway assets whose return may be considered in a sense problematical and uncertain, was equally divided between earnings and the proceeds from the sale of new capital.

In apportioning these expenditures, there has been a rough approximation to the principle laid down by Mr. Little. The proceeds of stock and bond sales have been generally invested in equipment, second track, extensions or enlargement of terminals, forms of investment, in other words, which are likely to be immediately profitable, and on the other hand, the reservations from income have been put into forms in many cases indirectly and remotely productive.

A good illustration of this classification of expenditure is furnished by the extraordinary expenditures of the Pennsylvania for 1902. These included, among other items, the elevation of the tracks through Newark and New Brunswick and the revision of the line through Trenton to eliminate the grade crossings in these cities. The change of line at Trenton involved the construction of a stone bridge over the Delaware, and a change of tracks on the opposite of the river to correspond. We find also among these extraordinary expenditures such items as the substitution of stone for iron bridges, and the improvement of passenger stations. The return on these investments, as above remarked, is not immediate. Some years may elapse before a profit is earned. It is proper, therefore, that the earnings of the road should provide the money. On the other hand, the building of the new freight line around Pittsburg, the four tracking of portions of the line, the construction of classification yards and the reduction of grades and curves will immediately increase the earnings of the Pennsylvania, and are, therefore, proper objects for the increase of

capital. These so-called extraordinary expenditures do not, as a rule, figure in the balance sheet. The value of the assets which they represent is yet uncertain, and conservative management will not add the amount of these expenditures to the surplus, although if they justify themselves, the stockholders will eventually reap the benefit, either in an increase of dividend rate or in distribution of assets.

I am aware that this dividing line between the investment of earnings and the investment of the proceeds of bond sales is not rigidly adhered to, nor would I deny that earnings may not, on occasions, be invested in forms which will yield a large return, or that all investments of earnings, if wisely made, will not be ultimately profitable. Generally speaking, however, in spite of the conspicuous instances to the contrary which are furnished by the betterment policy of the Lehigh Valley and the Southern Pacific, Mr. Little's principle has been accepted and systematically applied by American railroads in the management of their capital account. Stockholders of prosperous and established companies have a right to demand that when a large margin over fixed charges or dividends is immediately assured on the investment of capital, the amount necessary should be raised by the sale of securities, and not taken out of earnings. They are equally concerned to protest against a policy which goes to an extreme in this direction, and distributes nearly all the earnings, while raising money by the sale of bonds for construction whose profitableness, while assured, is not likely to be immediately conspicuous.

The betterment policy of the Lehigh Valley is a forcible illustration of the injustice which may be done to stockholders by abnormal reservations from earnings.

This company, since 1899, has earned enough to pay a 4 per cent dividend and to be able to borrow at low rates of interest. Instead of paying a dividend, however, from 1898 to 1902, the directors spent $12,800,000 upon the property out of the net earnings of the company—$2,500,000 per year. If one-fifth of this amount had been devoted to interest payment, the amount required for the reconstruction of the property could have been borrowed, and over $5,000,000 could have been safely paid in dividends. The policy of the Canadian Pacific and of English companies, on the other hand, illustrates the risk of paying for betterments of doubtful profit out of the proceeds of capital sales.

Passing to the third division of the subject, we may raise the question whether abnormal operating expenses should properly be added to the surplus. The majority of railway companies increase their maintenance charges during periods when profits are large to an extraordinary degree. It has been argued, notably by the Interstate Commerce Commission, in a notable opinion on the advance of grain rates to the Atlantic seaboard, that large operating expenses were used to conceal profits, and that in addition to large dividends, certain companies were accumulating a large surplus none the less valuable because its annual increments are apparently swallowed up in the cost of operation.

This opinion, which is widely held, will not stand the test of critical examination. The large maintenance expenditures of the railroads during periods of prosperity are not properly to be included in a discussion of the surplus reserve. It is true that the unequal distribution of maintenance expenses, which rise and fall with railroad earnings, may be considered as a resource upon which, in lean years, the companies may

draw, and thus maintain the dividends. For example, take the item of rails. A steel rail may be expected to give service between fifteen and twenty years before it is finally scrapped. The strict requirement for maintaining the rails is, therefore, that at least one-fifteenth of the track should be relaid each year. If, however, in a year of large earnings one-tenth of the mileage is relaid, less than one-fifteenth can be relaid during the next year without allowing the condition of the property to deteriorate. This rule also applies to the maintenance of equipment and structures. Over a period of years a certain amount must be spent in repairs. These expenses, however, may be concentrated into a portion of the period, and by reducing maintenance charges during lean years an extreme reduction of net earnings may be prevented.

An illustration of the advantages of this method of concentrating operating expenses into the years of large earning for the benefit of dividends during periods of depression is furnished by the experience of the Burlington from 1887 to 1891. Owing to a large construction of new mileage and to a combination of unfavorable circumstances the surplus over fixed charges decreased from $2,596 per mile in 1883 to $484 in 1891. As a result the dividend was reduced from 8 to 5 per cent. The dividend, however, must have been entirely suspended had not the company been able to make large reductions in its maintenance charges. The heavy maintenance expenses of the Burlington during the years of large earnings could not properly be considered as additions to the value of the property, because they did no more than enable the company to maintain a moderate dividend during a period of depression. Furthermore, in view of the fact that railway compa-

nies, as a rule, do not maintain depreciation accounts, in spite of the fact that their plant is liable to the same process of decay as the equipment of mining or manufacturing companies, and that their equipment is constantly being thrown out of use by the introduction of improved appliances, it is safe to say that even if these charges to maintenance expense on their face appear to be most excessive, and even if this excess is maintained during periods of depression, it is no more than a fair equivalent for the depreciation charge which should appear on their profit and loss accounts.

We turn, in conclusion, to consider the methods by which the surplus may be distributed to stockholders. There is no intention that the benefit of these reservations from profits for productive expenditure should be permanently withheld from the owners of the corporation. At irregular intervals, when the margin of safety for the dividend requirements is sufficiently great, the surplus is distributed to stockholders. Various methods may be employed to accomplish this result. The rate of dividend may be increased, or the assets of the company may be directly distributed to stockholders, either by means of a stock dividend, or what is known as a privileged subscription. The first method is less employed than the second. It is considered undesirable that the dividends of the corporation should exceed a moderate rate, say 5 or 6 per cent, not only because public hostility is aroused by the appearance of excessive profits, but because the market value of the stock, after a moderate rate of dividend has been reached does not advance proportionately with the increase in the rate of distribution. In other words, one share of stock which pays 12 per cent in dividends will under ordinary conditions sell for a much smaller amount of money than two shares of equal par value on which a 6 per cent dividend is paid.

The method of privileged subscription is therefore the one which is usually adopted. This method is familiar, and consists in offering new issues of stock to holders of record at a price below that which prevails in the market. A stock which may be selling at 150 in the open market may thus be offered to stockholders at 110. The stockholders may profit from this privileged allotment in two ways: either by holding the new shares and receiving the large return on the purchase price which the regular rate of dividend represents, or by selling his allotment in the market. This second transaction can be easily financed. The stockholder may sell short the number of shares which he is to receive and make his final delivery when the stock is issued, or, and this is the method commonly employed, he may sell his right to subscribe to the new stock, which is usually quoted on the exchanges. One advantage of this method is that apparently no distribution has been made. The liabilities of the corporation stand on its books at par, and there is no necessity of entering the result of a privileged subscription on the profit and loss account as discount on securities sold. In fact, the results of the transaction do not appear on the books of the company. The operation, nevertheless, results in a loss to the corporation. This may be understood if we conceive that the new stock which is to be issued is placed in the treasury of the company at a valuation which corresponds to the price which will be paid for it in the open market. If, now, this stock which is worth to the company 140 or 150 is sold to the stockholders at 110, the company has sustained a lost represented by the difference. The privileged subscription is, in fact, a distribution of the undivided equity in the company to its stockholders. This method is probably selected, as above remarked, be-

cause it is the method least understood by the public, and because, on that account it, seldom arouses comment, much less the opposition with which the declaration of a stock dividend would probably be saluted.

In conclusion, it may be of interest to observe that the general practice of offering securities on privileged terms to stockholders makes the return on many high grade stocks over a term of years considerably larger than the product of dividing the rate of dividend by the market price at any given time. These occasional profits, while reasonably assured, are too irregular and fortuitous to have more than a speculative influence upon the price of shares which are thus benefited. They do not, therefore, except for the period immediately preceding the distribution, figure in the investment judgment of the value of the stock. In other words, the investor who buys a 5 per cent stock at 120 has apparently invested his money at a rate of 4.2 per cent. If he holds his stock for ten years, however, it is altogether probable that, as a result of various privileged allotments and subscriptions, his return will be much larger.

For example, take the return on Illinois Central stock from November 1895 to August 1902. During this period the company paid a dividend of 5 per cent up to 1900 and 6 per cent thereafter and the price rose from 95 to 148.75, representing at the first date a return of 5.2 per cent, and in August, 1902, a return of only 4.1 per cent. On an average of the entire period, the yield on Illinois Central stock was not far from 4.1 per cent, a low rate of return. During these five years, however, the owners of Illinois Central participated in five privileged subscriptions, amounting in all to 70 per cent of the recorded holdings. An owner of 100 shares

who participated in the allotment, and who sold his stock immediately on delivery at the ruling market price, made a total profit of $2509.60, or 25.74 per cent on the market value of 100 shares at the date of the first allotment. Considering all losses and gains from the sale of the privileges, as distributed equally to December of the years 1896 to 1903 inclusive, the annual gain to the holder of 100 shares on the basis of the market price of November, 1895, was 2.69 per cent, making the annual return on the stock if purchased at that date 7.89 per cent. Of course, if the stock had been purchased at the higher prices, the gain would have been less, although still above the rate of dividend on the stock. If the stockholder prefers to hold his stock allotment, he can gradually raise the rate of return on his holdings to the dividend paid on the stock.

It is true that the stockholders of every corporation cannot look for as favorable terms as those granted by the Illinois Central, and in some cases, such for example, as the last issue of Pennsylvania stock, which was offered to shareholders at 120, the stock could have been afterward purchased below the subscription price. Generally speaking, however, stockholders of corporations whose dividends are reasonably well assured, and which sell at high prices in consequence, can materially increase their income by selling their stock allotments.

May we not hope that, when the public learn that the standard railway stocks offer the investor, along with the certainty of a moderate return, a strong probability of extra profits on privileged subscriptions, the demand for speculative stocks sold on representations of abnormal dividends may be greatly weakened, even if it can never be entirely destroyed?

THE MANAGEMENT OF THE SURPLUS RESERVE—DISCUSSION

JOHN H. GRAY: With the major portion of Dr. Meade's paper, I heartily agree. He will permit me, however, to express my regret that the occasion naturally required that the paper should be couched in such general terms as to raise the question of whether some of its statements, which apply without doubt to many parts of the field under discussion, may not need some further illustration when the attempt is made to apply them to other parts of the subject. From the nature of the corporate history of the last few years, I may be permitted to express my personal regret that Dr. Meade was not asked to confine his discussion more particularly to the class of corporations whose securities are so prominent on the stock market, and whose final position in the economic world still remains in such great doubt, namely, the industrials. For, as the members of this Association know, Dr. Meade has recently made marked and distinguished contributions to this subject.

In speaking of the amount of surplus reserve, if I understood Dr. Meade correctly, he said: "That a company which is organized on a speculative basis and whose stock contains an excessive amount of water, should reserve a larger proportion of earnings than a company which is firmly established in the confidence of investors." I think we should all agree that this were a consummation devoutly to be wished, but, at the same time, should probably feel that, in the language of the Greek grammarians, it is a supposition contrary to fact and to possibility. The history of the trust period,

if it has not demonstrated anything else, has demonstrated the fact that corporations cannot be organized with vast quantities of water and on a strictly speculative basis, without promises for the future which make it impossible, at least in the earlier years of their history, to accumulate so large a surplus as is indicated here. True, this inability may mean the early downfall of the corporation. On the other hand, a relatively small surplus, added to for a considerable number of years by a corporation in a growing community, may enable the corporation to live by luck. Again, it may be doubted whether the wholesale failure of corporations for lack of such a surplus will teach the public to stop putting their money in corporations organized in such a way as to make their continued solvency impossible.

In the distinction drawn by Dr. Meade between a surplus reserve invested in assets not connected with the life of the industry, and in assets which make an integral part of the equipment, he appears to me to take a somewhat more conservative view than the circumstances of any mere speculative industry require, when he says, "If, however, the surplus is looked upon as an integral part of the business equipment, and this seems to be a more correct conception of its place in the corporate economy, then the payment of dividends out of the surplus is to be condemned." * * * "In other words a dividend should never be paid unless it has been earned in the year in which it is declared." This appears to me to be one of the most important suggestions in his paper, and perhaps to run counter to the accepted theory of the nature and functions of the business corporation. Apart from the immortality of the corporation as over against the individual, the justification of the corporation has heretofore been con-

sidered to exist in the fact that under the principle of limited liability, people who had no technical knowledge of the industry in question, and who were not situated so that they could take a personal part in the management, might be induced to invest in the securities of corporations, and thus contribute the necessary capital for carrying on modern industry. If that be true, it becomes, in my opinion, fundamentally necessary in the public interest that these people should be able to count upon a steady and reasonably uniform rate of dividend. By definition, such investors are not interested primarily in the industry in question. They are too numerous, by mutual understanding and agreement, to unite and combine together in electing members of Boards of Directors. We are driven, therefore, to assume that they will be fleeced, and in conformity with the public interest may be fleeced, for the promoter and the underwriter who float purely speculative enterprises, or, that they should be compelled to put their earnings into an investment in a manner at variance with the accepted theories of the advantages of the corporate form of industry. This means either that the savings of the small property owner shall be filched from him by the promoter or the underwriter, and he, according to Dr. Meade's well known definition, be not classed as an investor, but that he be compelled to wait for the income from his investment longer than his circumstances justify him in waiting, and in such a manner as to contradict the accepted theory on which men are permitted to turn their property into the corporate form.

It is quite true that during the revulsion following 1893, many railroads, which for the most part have become real investments as distinct from speculative holdings, were bankrupted in the absence of an adequate re-

serve by the severity of the depression. I believe, however, that it is equally true that many railroads kept up their dividends, often at a reduced rate, out of their surplus of previous years, with very great advantages to the corporations themselves, the holders of their shares, to the general public, and especially to the developing of that sentiment in the public mind which is necessary for the economic development of the future.

Another very important part of Dr. Meade's paper is that in which reference is made to what may be called the inter-connection between the banking world and the ordinary business corporation. From the standpoint of the change of sentiment in this country the reference is of pathetic interest. When the bankers of this country began to come into control of railroads and other industrial enterprises, it was often remarked that it meant a change in the conservatism with which the banking business would be carried on, but it was confidently believed that the loss in that particular due to the traditions of bankers, might be more than off-set in the greater conservatism manifested in the management of other business. Alas, the history of the trust period of the last four years goes far to show that the banker has become the chief promotor in the offensive sense of the term, and lending his great reputation and prestige to the wildest of schemes, has been able, as a promotor, to float schemes which the public would have ignored and refused to touch save for the added element of stability, wisdom, and conservatism that the banking fraternity was supposed to give to the enterprises to which it loaned its name.

It is true that on the question of the general desirability of such relation between the bankers and general industry, Dr. Meade is rather non-committal, turning it

off with the phrase that "it already exists"; yet some of his other remarks would lead one to infer that he gives his approval to the idea. For instance, he says subsequently: "These arrangements are mutually profitable and are increasingly common." He often, as it appears to me, introduces a slight confusion which, alas, is too common in corporate management, between the interests of the directors of corporations and the interests of the corporations themselves, when he said, if I understood him correctly, that "the arrangement would be more profitable to the corporation directors if they were stockholders in the banks which make such large profits by loaning out their deposits." The banking reserve of the country under our imperfect banking and currency systems is already in a delicate and serious enough situation, without encouraging the further development of a relation which, so far as our experience goes, appears decidedly injurious.

I wish to say but a word in regard to Dr. Meade's position in regard to the sources from which the funds should come for different kinds of investments. As I understand his position to be, it is that new securities should be issued for capital only in those cases in which dividends are assured at a very early date, and that other additions to the investment should be made out of the profits. At this point, it seems to me a distinction must be made on the lines which I suggested at the very beginning, namely, on the character of the industries carried on. Without time to develop the thought, I will venture to suggest that in the case of public service corporations, and more especially of those with a fixed or traditional charge, such as gas companies and street car companies, which, if organized in any considerable centers of population, are remarkably safe, all capital

for additional investment should be raised by the sale of securities. Experience has shown that in these cases, at least in the larger centers of population, the accumulation of a large surplus in the present state of the law and the public mind, the issuing stock dividends and capitalizing earnings, in connection with the feeling of what is a fair rate of dividend on actual investment leads not only to highly artificial attempts to capitalize the earnings, but has provided one of the most attractive fields for the undesirable and dangerous plunger and speculator who wrecks the corporations. The English method in these cases for the distribution of earnings and acquisition of funds for additional investments out of capital sales, seems to me perfectly desirable. Of course, it is not to be forgotten that in such cases as this, the solvency and life of the corporation, even in times of depression, are virtually assured, provided the company is managed with reasonable honesty and efficiency, because prices are virtually fixed, the same in good times and bad, and the amount of business is relatively speaking, but slightly affected by periods of depression.

If time permitted, I should like to say something in regard to the methods of distributing the surplus money to stock-holders. I think something at least in the public interest could be said against the proposition of Dr. Meade, so far as the kinds of corporations from which he draws his illustrations are concerned. One might infer from Dr. Meade's statement that he doubted the expediency of attempting to limit the earnings of railroad corporations directly or indirectly. A discussion of this point, however, would lead me too far afield.

I hope nothing I have said will lead any one to think for a moment that I do not have the highest appreciа-

tion of the form and substance of Dr. Meade's paper. My desire has been rather, without in any manner detracting or seeming to detract from the value of that paper, to call attention to some phases of the broad subject which seem to me to deserve further investigation before it will be possible to arrive at broad generalizations and definite conclusions.

VICTOR ROSEWATER: I can present only a few ideas that might be suggested by Dr. Meade's excellent paper to any one devoting some thought to it, but who had not been able, as he has, to make a thorough special study of the question.

1. The surplus reserve differs in no way from the fund produced by the sale of the capital stock. In economic concept it is a part of the concern's capital; if the capital were ample for all the purposes of the corporation there would be no occasion for withholding any part of the earnings to constitute a surplus reserve.

2. The surplus reserve, being really undivided profits, belongs to the shareholders. It is deferred dividends. It is merely a matter of book-keeping then whether it is (a) allotted at once and held in trust as the property of the individual owner subject to the corporation's use, or (b) held in lump sum without allotment in severalty, or (c) turned into the capital account against the issue of stock dividends, or (d) merged with the capital and other assets to enhance the value of the outstanding shares without increase in their number. Whatever plan be followed, it is simply by virtue of a speculation on the chances of returns in the future.

3. If there is to be a surplus reserve and it is no different in essence from the capital, why should there be any different management for it, or any different field for

its investment, than for surplus or uninvested capital? If the business of the corporation needs additional capital, the with-holding of undivided profits to make up the deficiency may be the best way to raise the money. There is no good reason, however, why, except for temporarily tiding over fluctuating demands upon the resources, the surplus reserve should be invested outside of the business than that the capital should be so invested —the result is for the corporation to take up objects different from those that prompted its incorporation.

Dr. Meade cites an extreme case where the Pennsylvania Coal Company has paid all of its dividends out of New York City real estate investments. It would be difficult to say whether the coal company had not actually become a realty company and if the returns from the real estate investments prove really more profitable than the returns from the coal operations, not only its reserve but its capital should be diverted to the realty business and it should retire from the coal trade so as to earn the highest possible revenues for its shareholders. This recalls very much the New York bank that for many years did business on a charter for a water works plant "and for other purposes," and kept a tank on the roof of its building to prevent forfeiture of its charter. What need to practice such deception in these days?

4. Dr. Meade lays it down as a fundamental principle of sound financial management that dividends be paid out of earnings only—*i.e.*, as distinguished from dividends paid out of capital to the impairment of the assets. He would even condemn payment of dividends out of surplus after the surplus had become "an integral part of the business equipment." Whether it is to be regarded as part of the business equipment, however, depends entirely upon the directors or management and

there is nothing to prevent the distribution of the permanent surplus reserve as stock dividends even after it has been so listed for years and became an important element in the stock values. What the surplus reserve does then is to facilitate unearned dividends out of capital whenever stock jobbing interests demand.

5. As a matter of fact the question of dividend distribution has no definite relation to any particular time period. The justification of the reserve, aside from its merger into the capital account, is its desirability as a guaranty of steady dividends against fluctuating business and variable profits and losses. As an insurance fund it is an admission that the undivided profits are only nominally a surplus because the entire time period, which might be six years as well as six months, has not elapsed and a balance struck at this particular time would not be a true balance. What such corporations should do is to ascertain the actual earnings that may be counted upon for a series of years and guage their dividends accordingly.

6. What Dr. Meade says about the division of betterment expenses between undivided profits and the proceeds of stock sales is interesting but his conclusions as to the dividing line are, and must be, indefinite because they rest on the prospect of immediate increase as income and depend merely upon the time period held in view. An immediate increase of income does not necessarily mean that the increase be measurable before the next dividend day. It would be just as precise to say that betterments that add to the original value of the corporation's property could safely be based on new capital sales without impairing the value of outstanding capital stock, while recoupment of losses and restoration of depreciation should always come out of profits ahead of

dividends. Where betterments are paid for out of earnings it is the same thing as the diversion of dividends to the surplus reserve.

7. The dangers of surplus reserve financiering seem to me to be too lightly passed over in Dr. Meade's optimistic review. The management of the corporation is assumed to be the deliberate and intelligent action of the stockholders when in truth it is only the action of the directors and is frequently inspired by individual, if not selfish, motives. These dangers are roughly two-fold, (a) the use of the surplus reserve for stock market manipulations and (b) the use of the surplus reserve for corporation graft. Dr. Meade gives examples of both which should be further emphasized.

a. As to stock exchange manipulations. The conversion of profits into surplus and surplus into dividends or betterments is easily convertible into stock market movements. The men on the inside too often take advantage of their information not only over the outside public but also over the outside shareholder.

The distribution of the surplus reserve by privileged subscriptions is confessedly a deception to obviate the prejudice against stock dividends "because it is the method least understood." The stockholder who sells short to the best advantage the number of shares he is to receive is sure to be the privileged stockholder who is also in the directory and his selling is likely to bear the market for the other stockholder by the time he is ready to unload.

b. As to corporation graft. It is notorious that the dividends are not the only profits reaped by those on the inside of the corporation management.

The deposit of cash balances making up the surplus reserve at "a small rate of interest" in banks whose

officers are also directors of the corporation, thus drawing an extra profit over the common shareholder is not different, except in degree, from the employment of those same banks to float big blocks of watered stock at exorbitant commissions.

The investment of the surplus reserve in securities of a second corporation, in which the directors or only a part of the shareholders of the first corporation are interested, is equivalent to paying an extra dividend to those who are interested in both. It is hinted that the relations that exist between several large eastern insurance companies and the trust companies through which their securities are bought are of this nature.

If the maintenance account is to be inflated to cover up a growing surplus, such, for example, as by an anticipatory investment in steel rails at top notch prices, the community of interest between the directors of the two corporations (buying and selling) is apt to exert an influence not necessarily for the benefit of the ordinary shareholder.

In a word, the surplus reserve can offer most convenient facilities for discrimination between the privileged and the unprivileged stockholders, the same sort of graft that absorbs profits by princely salaries to high officers and favored relatives, big rents for quarters belonging to some milking company, or fat contracts to an inside construction ring.

8. Strangely enough, then, the consideration of the management of the surplus reserve, to my mind, reverts to the very starting point, namely, the necessity for full publicity for all corporations tinged with a public interest and strict supervision of their financial operations by a competent public authority vested with powers to audit and control similar to those now exercised over our national banks.

HENRY RAND HATFIELD: Five points may be emphasized in discussing Dr. Meade's paper. These are: the purpose of establishing a surplus reserve, its amount, its investment, its treatment in the balance sheet, and its distribution.

The purpose of establishing a surplus reserve, as stated by Dr. Meade, is either to guarantee interest and dividend, or to provide an investment for the stockholders. There are at least two other purposes distinctly recognized in actual business practice. These are (1) to give creditors a general guarantee, in addition to that furnished by the capital stock, and the stockholders liability. This is noticeable in the case of banks, where the establishment of a surplus is customary and, as in the case of our national banks and in the German Reichsbank, sometimes compulsory. (2) To provide ready funds for emergency purposes.

One purpose in creating a surplus, which is mentioned by Dr. Meade, seems incorrect. A surplus reserve is not designed to provide revenue outside of the scope of the business. This does not mean that the surplus may not at times be invested in outside fields, nor that a surplus when invested should not yield a revenue. The object of any corporation is to carry on some definite business. In carrying on that business it may exercise certain implied powers. If a factory can best manufacture, if it can best maintain its integrity, its solvency, its credit, by holding outside property, well and good. But it is out of place for a coal company to derive its main income from New York real estate. The great trusts are not trust companies, and should only hold outside property in so far as their own particular business demands such outside holdings. If the business itself is not profitable, it is better that that

fact should appear, rather than it should be concealed by profits from entirely disconnected sources. If the managers of a corporation cannot make a satisfactory profit in their regular business, there is no presupposition in favor of their being more successful in some outside investment, and the stockholders should not be dragooned into entrusting them with additional funds.

In his discussion of the amount of surplus reserve, Dr. Meade states that it should vary with the constancy of demand for the product. This would be better amended to say that it depends on the constancy of profits; for a lessened demand for the product, if accompanied with a decreased cost of production,—a condition by no means impossible,—would leave profits constant. But a much more serious omission is made by the author, both in his paper and in his work on "Trust finance," in that he neglects to show the bearing which the form of capitalization has on the question of the amount of surplus which should be reserved. The industrial corporations for instance have been severely criticised on the ground that the percentage of surplus to dividends is so much less than the percentage of surplus to dividends is in the case of railroads. This ignores the fact that the railroads have a large bonded debt, while the industrials are almost unbonded. It is apparent that of two corporations, one with $100,000,000 in bonds and $100,000,000 in stock, the other with no bonds and $200,000,000 in stock, the former should reserve a larger proportion of its dividends and should, moreover, maintain a larger surplus in proportion to its total capitalization. For this there are two reasons, (1) the evil of defaulting in interest is so much greater than that of passing a dividend, that the protection should be greater; and (2) the very fact of the fixed interest charges

makes the fluctuation in annual profits more wide. To illustrate this. If the surplus of income over operating expenses varies from $9,000,000 to $15,000,000, the profits on the $200,000,000 stock would vary from 4½ to 7½ per cent; but if half the capitalization consisted of first mortgage 5 per cent bonds, fluctuations in profits would vary from 4 per cent to 10 per cent per annum; in the first case a range of 66 per cent, in the second of 250 per cent. Quite aside, then, from the speculative character of the business undertaking, quite aside also, from the question of the nature of the business, as to its quasi-public character, the form of the capitalization is an important factor in determining the amount of reserve which should be kept back as a guarantee.

Turning to the question of the investment of the reserve, this surely can only be answered when we consider the purpose for which it is established. If it is to afford investment, it should go into the most profitable investment; that is, the business itself. If it is to provide for emergencies, it should be in some liquid form, which can easily be drawn upon. Dr. Meade on this point falls into contradiction. In the first part of his paper, he says that the reserve should ordinarily be invested in plant and equipment. Later, while discussing the question of extensions, he says: "When a large margin over fixed charges or dividends is immediately assured on the investment of capital, the amount should be raised by the sale of securities and not taken out of earnings." But it may be questioned why there should be so much discussion of the investment of the surplus reserve. Why should the surplus have a special corresponding item among the assets? It almost seems at times as though the author were misled by the use of his pet phrase "surplus reserve," and thought because

there is a surplus, there must needs be a specific reserve, such as is meant when we speak of the bank reserve. Is a fund of ready cash, or of easily negotiated securities, desirable in the assets of a corporation? Is it not equally desirable whether the corporation have a surplus or not? Dr. Meade paints a bright picture of the advantages of having available funds and shows how railroads have been wrecked, trusts demolished and stockholders ruined because there was no such reserve. It would therefore seem that at times the most profitable investment of any corporation may consist of that part of its assets held as an emergency fund. But what correspondence is there between this fund and the accumulated surplus? In the case of a bank, there is just as much wisdom and necessity of having some liquid assets when the bank first starts as when it has a surplus many times its capital, and I have never seen any claim that one should depend on the other. Similarly, in the case of any other corporation. If some percentage of a corporation's assets ought to be held in cash, or outside securities, or New York real estate, such investment should be made out of the proceeds of the original sale of bonds and stock just as surely as out of the surplus; if such holdings are not desirable, why should surplus reserve, which economically is indistinguishable from capital stock, be forced into an undesirable channel?

A fourth question is whether the profits reserved from distribution should so show in the balance sheet. It is not clear to me whether Dr. Meade's discussion of the treatment of betterment and of the source of unusual expenditures clearly faces this problem or not. A betterment is either an actual increase of fixed capital, or it is the recognition and restoration of wasted capital. In the former case, the actual surplus reserve is un-

affected, and Dr. Meade's discussion is in reality merely whether the surplus reserve is best invested in the plant. If the so-called betterment is in fact only a restoration of wasted capital, there is no special pertinence in discussing it in connection with the surplus reserve, for expenses must be paid, and the property must be kept up before we can talk of surplus at all. The surplus exists, as Dr. Meade shows, equally whether the betterments are charged to cost of plant (road and equipment) or treated as an expense. Whether that surplus shall be made manifest in the balance sheet is another question, and not logically connected with that of the advisability of selling securities.

I should myself urge greater accuracy in having the actual condition made manifest. The paying or the retention of profits is important, but showing of profits and losses is much more important, both to individuals, and to the public. Non-dividend paying bank stock frequently sells at a high premium, because it shows dividends earned. Expedience, public policy perhaps, frequently justify the hiding of earnings because the temptation is generally toward exaggeration rather than toward depreciation of profits, but the ideal goal of accounting is exact accuracy, and a hidden surplus is in its very term a confession of an inexact balance sheet.

Dr. Meade's final discussion of the distribution of the surplus reserve is contradictory. He speaks of such a distribution as being secured by raising the rate of dividend, or by privileged sale of stock. A raising of the rate of dividend, provided the new rate does not exceed the current annual profits, is, however, not a distribution of the surplus at all, nor is the privileged sale of stock at par a distribution of surplus. In the latter case the corporation increases its assets to the

same amount that its liabilities are increased, and the surplus remains unchanged. It may be a step toward the disbursement of a larger sum in annual dividends, but unless such distribution is more rapid than the making of profits, there is no lessening of the surplus. The surplus still remains on the balance sheet, and in its tangible, material embodiment among the assets. Distribution of profits derived from the investment of the surplus is no more distribution of the surplus than the payment of dividends derived from investment of the original capital is distribution of such capital.

THE THEORY OF LOAN CREDIT IN RELATION TO CORPORATION ECONOMICS

J. PEASE NORTON

Two chapters of societal economics cover the field of the distribution of wealth. The first studies the distribution of wealth *destined* for consumption and the second the distribution of wealth *destined* for production. In the first belong questions of individual welfare, and in this field the active agitations of the parties play. Socialism, for instance, would find its solution of one problem in a more equitable distribution of wealth, holding that Weber's law suggests that on the assumption of equality of enjoyment, equality of properties maximizes this ophelimity. Nor is it an answer to say that enjoyments are unequal; for even then the socialist case may stand.

Without more than suggesting these well worn problems, I call you attention to a parallel field, less clearly studied, but of far greater importance, the economics of the distribution of the control of wealth *destined* for the production of more wealth. I am conscious that in these words there may seem to be no distinction, since if man is wealth, all wealth consumed under the first division is also under the second. If we include men as wealth as Professors Fisher and Pareto do, then we should term wealth destined for consumption as wealth destined for personal production. There is no confusion in thought, although I take this opportunity to prevent confusion in wording. In the history of political economy, there has been such a distinction since the beginning, and this contrast is further heightened by that parallel conception of Professor Clark's, of an unchang-

ing body of capital, undergoing transmutation, but eternally existent. It is the distribution of this capital, viewed from the standpoint of control and not consumption that deserves greater attention than it has yet received.

Too much emphasis has been laid on the marginal utility side of economics, *i. e.*, on the enjoyment of the masses. In the crass struggle for existence, as Professor Sumner has shown, individual against individual, group against group, society against society, each group strengthens itself by co-operation and by systems of rewards within, but the problem is not so much in maximizing enjoyment (for enjoyment is after all secondary, since so much is unconscious and unreasoning) the real problem is to keep up and increase production.

Consequently, an equally important aspect to emphasize is equality of opportunity rather than equality of enjoyment, and the gain to society which comes from every method of distribution of productive wealth which puts control quickly into the hands of the men who can, and which takes it from the hands of the men who cannot.

This is not a defense of Wall Street methods, with a view to palliating obvious excesses, but an attempt to point out the fundamental relations among various economic magnitudes, which in their interaction through the play of human motives, ophelimites and capabilities, result in making the devices of credit and the complex methods of Wall Street financing as great an engine of production of more wealth as the arts of the farmer in digging the crops from the ground or new inventions which render the day's work of the laborer or the dollar of the capitalist twice as productive. There are three

distinctive questions in the situation at large. (i) The causes of the trend towards combination. (ii) The nature of instruments of credit. (iii) The lack of knowledge on the part of the public not so much as to what the statistics of earnings and costs are, as to the question what instruments of credit are with respect to security.

The standpoint which is the basis of the rapid advances in the Sumnerian sociology, the philosophy which views the phenomena of society from the standpoint of individuals, groups and societies—all of which is capable of statistical interpretation and measurements—is equally useful in the study of the distribution of productive wealth. The subject is best viewed, not from the standpoint of commodity, its demand and supply with price as a major factor, but from the standpoint of the individual, group, firm, corporation and trust, struggling with competitors, seeking to maximize its profits. The laws of monopoly in general apply, not the laws of competition. The question of prices is of minor importance in this subject. Goods, I care not what, are of two great classes, *competitive* and *non-competitive.* Competitive goods cover the staples capable of being graded. Non-competitive goods cover the great bulk of wealth, which is not capable of being graded with any accuracy. Prices are a matter of policy and not a result of an objective supply and demand. Every individual, firm, corporation or trust sells each article with reference to the maximum sum total of profit on all articles, and not with reference to the maximum profit on any particular article. In other words, each concern seeks to maximize its exploitation of the selling field of its influence.

Even the smallest stores are monopolies resulting from combination of location, non-competitive goods, skill and experience in what might be called the psychology

of customers, and instead of looking for laws of supply and demand for any article, we should look for skill in exploitation of desires created, and above all skill in the creation of desires. Consequently, what competition there is, is between concerns selling goods on monopoly principles along the lines of greater or less skill in creating desires. Prices of competitive articles are then fixed by competition, it is true, but not according to our laws of supply and demand. The price policy of the concern, which is a limited monopoly, determines these prices on the basis of the maximum sum total of profit on all goods, competitive and non-competitive.

Competitive articles exist because buyers can detect small differences. If it is easily possible to detect differences between two articles of the same class of say under 10 per cent of cost value at the same manufactory, the article is competitive. If experts cannot detect differences of 20 per cent of cost from inspection, as I have been told is the case in such a commodity as linen handkerchiefs, the unintelligent consumer cannot detect differences of 60 to 100 per cent. Mr. John Wanamaker stated before the Industrial Commission that his experts could not detect differences of fifty cents in costs of two pairs of shoes without ripping them into pieces. Comparison between prices of different stores or manufactories is, therefore, impossible in the degree to which the goods are non-competitive. The more that they are non-competitive, the more are they sold, not with reference to the prices charged by others, but with reference to what the traffic will bear. It would seem that the principles underlying railroad rates so clearly worked out by President Hadley underlie the price policy of modern business in general.

Price-slashing is done in competitive goods, because

it is only in these goods that consumers can compare prices. It is the essential feature of price policy that consumers shall believe competition is intense, and hence the parade in advertising competitive goods at cost and below cost. Why prosperity instead of ruin ensues for the concern is because the number of competitive articles is small in comparison with the number of non-competitive articles and price-slashing is one effective weapon in creation of the selling field.

There is, at the same time, one aim common to all concerns, to destroy competitive articles. Destruction of competitive goods consists in rendering them by some means non-competitive. One effective means for destroying competitive goods is by use of brands and new names, thereby producing artificial monopolies lasting the force of advertising. The price-per-pound test is destroyed by the use of packages. In food packages, paste-board supplies the concept of bulk. One great corporation has within a few years revolutionized the business in crackers, formerly competitive goods from the standpoint of the manufacturer, producing thereby an artificial monopoly through extensive advertising, brands and trademarks. We should not be confused by the fact that when competitive goods are destroyed for the producer, these goods which were formerly non-competitive for the retailer become thereby bitterly competitive for him. The reason is that consumers through advertising by the producer, come to know prices, and consequently price-slashing by retailers ensue. It is the practice of great department stores to cut to the quick the prices of well advertised cereals, patent medicines or food brands of which the price is widely known, entailing heavy losses, for the sake of the tremendous effect it produces in extending their

selling field through the sympathetic buying of other non-competitive goods because these few competitive goods are lower than elsewhere.

On the other hand, competitive goods for the jobber and wholesaler, like beans, rice, etc., are non-competitive for the retailer, because consumers cannot detect differences of perhaps 50 to 200 per cent on wholesale price. Consequently, the same grades are sold in the same retail stores at different prices, that the exploitation of each customer may be made as complete as possible, the customer paying all that he is willing to towards the maximum sum total of profit; and at different stores these goods are sold at different prices ranging up to often as high as 200 per cent range of the wholesale price. For instance, last winter at different stores, a few blocks apart, in New Haven, and on the same day the standard grade of kerosene oil was sold at prices ranging from eleven cents, one cent below cost, up to twenty cents per gallon.

Destruction of competitive goods is going along upon many lines. The following interesting side development is now under full headway. Well advertised brands, non-competitive for producer, become thereby competitive for the retailer. Although they are necessary articles for the latter to handle, they are unpopular with him because they do not contribute to the profit. To stem this hostile discrimination of the retailer, large owners of brands are becoming the owners of retail stores, thereby increasing the destruction of competitive goods, and increasing the monopoly of the selling field created through advertising. Examples of this movement are to be found with ease in shoes, tobacco goods, groceries and many other lines.

Consequently, I believe, monopoly prices are more

than ever the law of the business world. In fact, there never was a competitive price fixed by theoretical supply and demand curves except in the case of a few staples capable of being graded. Great staples capable of being graded are undoubtedly subject to the competitive prices of the exchanges, provided there are many buyers, and many sellers. But once let the supply become concentrated in the hands of a group, and the market disappears. The produce exchange is rather a relic of the past than a development of the present. Its existence is bound up with the existence of competitive goods, but the goal of business is the destruction of competitive goods. The weapons are fictitious grades, brands, patents, graded prices, the control of supply by any and every means, and the creation of demand by advertising.

A world of commerce is then primarily engaged, not with the satisfaction of desires where many books on economics commence, but with the creation of desires and this involves the whole theory of suggestionism and hypnotism. An authority on economics once remarked that the fundamental axiom of political economy is that man is a rational intelligent animal, but the difficulty is that we have confused the rule with the exception.

Gradually as great concerns have been built up, there has been added, what has been termed by Professor Sumner, the "monopoly of superiority," *i.e.*, a combination of skill, location, brands, patents, methods, etc., which *cannot* be duplicated, and if imitated result in a higher cost of production.

This brings us to *cost of production* which is an essential conception at this point. The sources of this classification are most varied, but I am particularly indebted to the little work by C. J. Watts on "The cost

of production," and the many articles that have been written by various authors upon questions of running expenses and fixed charges in railroads. This chart is simply schematic, but it is one used in many manufacturing plants, and is useful because it makes the abstract reasoning somewhat more concrete.

COST OF PRODUCTION.

Manufacturing Department.

(a) Material.	
Total value of piece material.	Manufacturing Supplies, *i.e.*, belting, emery, cloth, brooms, fuel, oil, etc.
(b) Labor.	
Total value of piece-wages of "productive labor."	Departmental "non-productive" labor, *i.e.*, foreman, clerks, truckers, oilers, roustabouts, etc.
	General "non-productive" labor, *i.e.*, shipping clerks, stock clerks, time-keepers, engineers, etc.

Buying and Selling Department.

Traveling expenses, salaries, freights, telephone and telegraph, express charges and *advertising*.

Fixed Charges.

Rent, taxes, etc., interest.

Risk.

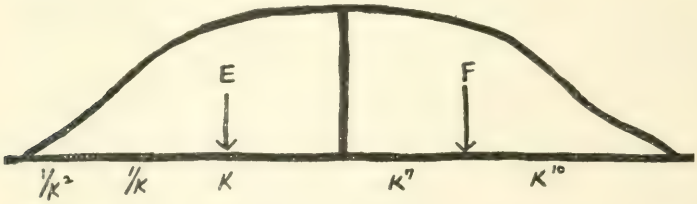
Insurance against various hazards, some of which vary with output as "*uncollectible debts*" and others such as "*fire*" do not.

A casual glance suffices to show that these items are arranged so that in the left column are the items which are easily chargeable to each piece produced, and tend to vary directly with the output, and in the right column are the items which do not vary directly with the output, but follow in gradation from manufacturing sup-

plies and so-called departmental "non-productive" labor, which increases considerably if output increases greatly, up to taxes and interest, which permit of tremendous increase of output, with comparative slight increase in themselves.

Let us call E the sum of the items in the left column for a given time, place and firm, *i. e.*, total expense varying with output. F is the sum of the items in the right column, the relatively fixed charges, including interest (I).

In strictness, there is no hard and fast line between running and fixed expenses, but like many other magnitudes in economics and biology, the correct statement is that expenses may be ranged along a frequency distribution according to the ratio which they vary with output.



The vertical scale in the above figure represents amount of expense and the horizontal axis the form-rate at which expense varies with output. To make a concrete case, we may assume the ratio of direct variation K, and then vary K from K^{∞} to $1/K^{\infty}$, placing the amount of expense opposite the appropriate value of the power of K.

There is little doubt that this curve could be easily fitted by either Professor Edgeworth's types of frequency curves or by Professor Karl Pearson's skew curves, and along these lines, I believe, great development is possible for theoretical economics, since by posit-

ERRATA

Page 42, line 8 (from bottom). For the first K in this line read K°.

Page 43, line 6 (from top). For K read K°.

ing these frequency distributions severe thinking will be able, step by step, to work out the various cases. We may now split the frequency curve at the median, and take the average of each half of the frequency array. The assumption of the theory of railway rates is that the average of the left half is about K, *i. e.*, direct variation, and this quantity is termed running expense, and will be designated as E. The average of the right half is a power of K sufficiently high to be treated in analysis as a constant, provided output is not increased too greatly. For instance, if $K = .10$, K^{10} the average variation of fixed expense, is $(.10)^{10} = .0000000001$, an almost negligible variation. In the following analysis, letters are used to represent the variables as explained in the following table:

TABLE OF VARIABLES.

No.		
1.	A, B, C, etc.	= different articles.
2.	π_a, π_b	= selling price for articles A, B, etc.
3.	ω_a	= output of article A.
4.	E_a	= total expense varying with output, *i.e.*, "running expenses."
5.	F_a	= total expenses not varying with output, *i.e.*, "fixed expenses," not including interest.
6.	P_a	= profit. = Sales—running expenses—fixed expenses.
7.	P'_a	= profit upon article = price—piece cost—fixed expense cost.
8.	$\omega_a \pi_a$	= value of sales.
9.	e'_a	$= \frac{E_a}{\omega_a}$ = piece cost per article.
10.	p'_a	$= \frac{P_a}{\omega_a} = \frac{\omega_a \pi_a - E_a - F_a}{\omega_a} = \pi_a - e'_a - \frac{F_a}{\omega_a}$
11.	C	= original capital of entrepreneur.
12.	C′	= borrowed capital, *i.e.*, credit.

The next three quantities depend on the preceding for definition, and are capable of double definition according to whether we take as our fundamental variable

cost value or selling value. To provide for both possibilities, I have given the two definitions in each case.

Cost value *i.e.*, $E_a + F_a$	Selling value *i.e.*, $\omega_a \pi_a$
13a $p_a = \frac{\omega_a p'_a}{E_a + F_a}$ = percentage of profit on cost of production.	13b $p = \frac{\omega_a p'_a}{\omega_a \pi_a} = \frac{p'_a}{\pi_a}$ = percentage of profit on selling value or sales.
14a $e = \frac{\omega_a e'_a}{E + F}$ = percentage of varying expense reckoned on total cost of production.	14b $e = \frac{\omega_a e'_a}{\omega_a \pi_a} = \frac{e'_a}{\pi_a}$ = percentage of varying expenses on sales.
15a $n = \frac{E_a + F_a}{C}$ = number of times capital is turned over reckoned under cost of production.	15b $n = \frac{\omega_a \pi_a}{C}$ = number of times capital is turned over reckoned under selling value.

The definition of (n)* (15b) as sales value divided by capital is the common one in the business world. On the other hand, (p) and (e) are generally computed on cost, although 13b is often used. In many kinds of business p is computed on the wholesale price of goods, *i.e.*, a fraction of e. It seemed wise, therefore, to provide at least for two possibilities. We are free to use the formulæ that are most convenient in expression, since the definitions are of such a form that the quantities are readily transferable. At the same time no confusion can arise since the main possibilities are clearly provided for.

The balance of the paper may be divided into four parts. (I) The percentage on capital realized by the concern operating without credit. (II) The percentage on capital realized by the concern operating with credit. (III) The gain experienced by the use of credit meas-

* To the reader unfamiliar with the conception of rate of turnover, reference should be made to Professor Irving Fisher's article, "The role of capital in economic theory," *Economic Journal*, 1897, in which the importance of this factor was first enunciated.

ured in percentage on capital. (IV) Discussion of this formula with reference to "high finance."

(I.) *Percentage on capital realized by the concern operating without credit.*

Net profit = sales value — running expenses — fixed expenses.

It is plain that there are eight cases, as we use definitions (*a*) or (*b*) for quantities (*p*), (13), (*e*) (14) and (*n*) (15). The table of possibilities follow:

Cases.	*Form.*	*Expressions.*	(*p*)	(*e*)	(*n*)
i	aaa	13a, 14a, 15a	$\frac{\omega p'}{E+F}$	$\frac{\omega e'}{E+F}$	$\frac{E+F}{C}$
ii	aab	13a, 14a, 15b	$\frac{\omega p'}{E+F}$	$\frac{\omega e'}{E+F}$	$\frac{\omega\pi}{C}$
iii	aba	13a, 14b, 15a	$\frac{\omega p'}{E+F}$	$\frac{e'}{\pi}$	$\frac{E+F}{C}$
iv	abb	13a, 14b, 15b	$\frac{\omega p'}{E+F}$	$\frac{e'}{\pi}$	$\frac{\omega\pi}{C}$
v	baa	13b, 14a, 15a	$\frac{p'}{\pi}$	$\frac{\omega e'}{E+F}$	$\frac{E+F}{C}$
vi	bab	13b, 14a, 15b	$\frac{p'}{\pi}$	$\frac{\omega e'}{E+F}$	$\frac{\omega\pi}{C}$
vii	bba	13b, 14b, 15a	$\frac{p'}{\pi}$	$\frac{e'}{\pi}$	$\frac{E+F}{C}$
viii	bbb	13b, 14b, 15b	$\frac{p'}{\pi}$	$\frac{e'}{\pi}$	$\frac{\omega\pi}{C}$

It will not be necessary to point out to this audience more than a single case and then produce the results for the remaining cases, reached in exactly the same manner.

Case i. Let

$$p=\frac{\omega p'}{E+F}, e=\frac{\omega e'}{E+F}, n=\frac{E+F}{C}.$$

It is plain that value of sales is $nC(1-p)$, varying expenses $e(nC)$ and fixed expense F. Consequently,

net profit = sales — varying expenses — fixed expenses;
(16) net profit = nC (1 + p) — e (nC) — F.

Dividing by C, we obtain the percentage of net profit on capital of the entrepreneur, operating without credit in terms of turnover, capital, percentage of profits, percentage of varying expense, and fixed expenses. Percentage net profit

$$= n(1+p) - en - F/C$$
$$= n(1+p-e) - F/C \qquad (17)$$

Working out the remaining seven cases, we obtain values for the net percentage profit, given in the table below. All results represent the same quantity—net percentage profit, but expressions differ according to various commercial definitions of p, e and n.

TABLE OF EXPRESSIONS FOR NET PERCENTAGE PROFIT.

Cases.	*No.*	*Possibilities.*	*Net Percentage Profit.*
i	(18)	13a, 14a, 15a	$n(1+p-e) - F/C$
ii	(19)	13a, 14a, 15b	$n(1+e-pe) - F/C$
iii	(20)	13a, 14b, 15a	$n((1+p)(1-e)) - F/c$
iv	(21)	13a, 14b, 15b	$n(1-e) - F/C$
v	(22)	13b, 14a, 15a	$n\left(\frac{1}{1-p} - e\right) - F/C$
vi	(23)	13b, 14a, 15b	$n\left(1 - \frac{e}{1-p}\right) - F/C$
vii	(24)	13b, 14b, 15a	$n\left(\frac{1-e}{1-p}\right) - F/C$
viii	(25)	13b, 14b, 15b	$n(1-e) - F/C$

To illustrate these formulae, suppose the stock of a retail store is turned over ten times per year. Assume the percentage of profit on total cost to be thirty per cent, and the percentage of varying expense ninety per cent of total expense. The fixed charges might be $500 and the capital of the entrepreneur $1,000. Then the percentage realized on capital would be by (18)

$$10(1 - .30 - .90) - 500/1000$$
$$400\% - 50\% = 350\%$$

In certain kinds of business, one set of definitions would be more useful than another from the standpoint

of practical statistics, and in some instances the treatment of E alone as the fundamental variable would be useful. The definitions of case vi are widely used by manufacturers and wholesalers who sell by catalogue. A list price is the basis for all discounts. Consequently, the percentage of profit is computed on the maximum price charged, *i. e.*, the list price. Where the list price is maintained on the one price basis to all, these definitions are very convenient. But, when, as is generally the case, the list price is simply the basis of charging what the traffic will bear, by giving a different discount to each customer, these definitions are not so convenient as some of the others.

(II.) *The percentage on capital realized by the concern operating with credit.*

The volume of the turnover is now increased from C to $C+C'$; *i. e.*, the original capital (C) plus the borrowed capital (C').

Case (i). Let

$$p=\frac{op'}{E+F} \quad e=\frac{oe'}{E+F} \quad n=\frac{E+F}{C+C'}$$

Net profits = sales — varying expenses — fixed expenses — interest.

Substituting for sales, $n\ (1+p)\ (C+C')$, varying expense, $e\,n\ (C+C')$ fixed expenses, F, and interest $C'\,i$, we have: (26) net profits

$$=n\,(1+p)\,(C+C')-e\,n\,(C+C')-F-C'i.$$

Dividing the above expression by C, we obtain the percentage net profit on capital.

Percentage net profit

$$=\frac{C+C'}{C}(n\,(1+p))-\frac{C+C'}{C}(ne)-\frac{F}{C}-\frac{C'}{C}i$$

$$(27) \qquad =\frac{C+C'}{C}(n\,(1+p-e))-\frac{F}{C}-\frac{C'}{C}i$$

The percentage net profit is given for the eight possible cases in the following table:

TABLE NET PERCENTAGE PROFIT WITH CREDIT.

Cases.	*No.*	*Net percentage profit.*
i	(27)	$\frac{C+C'}{C}(n(1+p-e)) - F/C - \frac{C'}{C}i$
ii	(28)	$\frac{C+C'}{C}(n(1+e-pe)) - F/C \quad \frac{C'}{C}i$
iii	(29)	$\frac{C+C'}{C}(n(1+p)(1-e)) - F/C - \frac{C'}{C}i$
iv	(30)	$\frac{C+C'}{C}(n(1-e)) \quad - F/C - \frac{C'}{C}i$
v	(31)	$\frac{C+C'}{C}(n(\frac{1}{1-p} - e)) - F/C - \frac{C'}{C}i$
vi	(32)	$\frac{C+C'}{C}(n(1 - \frac{e}{1-p})) - F/C - \frac{C'}{C}i$
vii	(33)	$\frac{C+C'}{C}(n(\frac{1-e}{1-p})) \quad - F/C - \frac{C'}{C}i$
viii	(34)	$\frac{C+C'}{C}(n(1-e)) \quad - F/C \quad \frac{C'}{C}i$

(III.) We are now in a position to measure the gain in percentage of net profit on capital realized by the same concern operating with and without credit. It is plainly the difference between the expressions given in the two preceding tables for the respective cases.

Without going in detail into the results under the various possibilities with respect to whether the company increases its business solely through the influx of credit or in addition through a readjustment of the factors (n), (p) and (e, I shall consider briefly the case in which the business increases and (n), (p) and (e) remain constant, and secondly the case in which (n), (p), and (e) change. It is probable that careful study along the lines of maxima and minima would be valuable, but at this point algebraic methods are sufficient for our purposes.

To illustrate the method, case (i) is worked out in detail under the assumption that the business increases

solely through the influx of credit and the factors (n), (p) and (e) remain unchanged, an assumption which would be seldom realized. Subtracting (17) from (27), we obtain (35).

(27) Net percentage profit with credit

$$= \frac{C + C'}{C}(n(1 + p - e)) - F/C - \frac{C'}{C}i$$

(17) Percentage net profit without credit

$$= (n(1 + p - e)) - F/C$$

Gain in percentage of net profit through use of credit

$$= \frac{C'}{C}(n(1 + p - e)) - \frac{C'}{C}i$$

(35) $$= \frac{C'}{C}(n(1 + p - e) - i)$$

In words, the gain realized by the use of credit is the product of two factors, the ratio of borrowings to capital and the difference between the turnover times the net percentage profit on total cost and the rate of interest.

The following table gives the expressions of this gain for the eight cases that we have previously used.

TABLE OF EXPRESSIONS FOR THE GAIN THROUGH THE USE OF CREDIT.

Cases.	*No.*	
i	(35)	$\frac{C'}{C}(n(1 + p - e) - i)$
ii	(36)	$\frac{C'}{C}(n(1 + e - pe) - i)$
iii	(37)	$\frac{C'}{C}(n(1 + p)(1 - e) - i)$
iv	(38	$\frac{C'}{C}(n(1 - e) - i)$
v	(39)	$\frac{C'}{C}(n\left(1 - \frac{e}{1 - p}\right) - i)$
vi	(40)	$\frac{C'}{C}(n\left(\frac{1}{1 - p} - e\right) - i)$
vii	(41)	$\frac{C'}{C}(n\left(\frac{1 - e}{1 - p}\right) - i)$
viii	(42)	$\frac{C'}{C}(n(1 - e) - i)$

If now we assume that the volume of sales increases with a readjustment of the turnover, percentage of profit and percentage of varying expense, which is probably the ordinary case applicable to the industrial combinations, the expression of percentage, net profit on capital, assuming the original capital the same, is easily obtained.

(27) Net percentage profit with credit

$$= \frac{C + C'}{C} (n_2 (1 + p_2 - e_2) - F/C - \frac{C'}{C} i$$

(17) Net percentage profit without credit

$$= n_1 (1 + p_1 - e_1) - F/C$$

(36) Gain in net percentage profit through use of credit

$$= \frac{C'}{C} (n_2 (1 + p_2 - e_2) - i) + (n_2 - n_1)$$

$$+ (n_2 p_2 - n_1 p_1) + (n_1 e_1 - n_2 e_2)$$

(IV.) *Discussion of formula (36).*

In discussion of the principles, one formula is as useful as another. I shall, therefore, confine the discussion to formula (36), in which the gain in net percentage profit is

$$\frac{C'}{C} (n_2 (1 + p_2 - e_2) - i) + (n_2 - n_1) + (n_2 p_2 - n_1 p_1) + (n_1 e_1 - n_2 e_2)$$

The subscript (2) refers to the value of the factors under the regimé of credit with the larger amount of business, and (1) to the value of the factors when borrowed capital is not used. We may on inspection derive the following conclusions:

(a) Provided $n_1 = n_2$, $p_1 = p_2$ and $e_1 = e_2$, as long as the product of the rate of turnover times unity plus the difference of percentage of profit and varying expense, *i.e.*, $(n(1 + p - e)$, is greater than the interest rate, (i), gain arises through the use of credit, and it is directly

proportioned to the amount of credit extension and inversely proportioned to the amount of capital.

(b) The rate of turnover (n) is very considerably under control, and the methods of increasing (n) lie primarily in advertising, *i.e.*, in the extension of the buying field. An efficient organization of the departments of the concern tends to raise (n), by diminishing the stock necessary to provide for fluctuations in the arrivals and shipments of the commodity. A reduction of percentage of profit, (p), increases the rate of turnover, less in non-competitive than in competitive goods.

(c) The variable (p), *i.e.*, percentage of profit on total costs is largely under control, and its value is fixed at the figure which will maximize the sum of the expressions $n\ (1 + p - e)$, of which there are as many as there are articles sold. In highly non-competitive goods, this is easily accomplished by maximizing for each non-competitive article the expression $n\ (1 + p - e)$. In highly competitive goods, the percentage of profit is fixed with reference to the effect on the selling field, and a negative value to $n\ (1 + p - e)$ for competitive goods will often temporarily increase the total sum of profit on all goods through sympathetic buying occasioned by extensive advertising. At the same time, every effort will be made to destroy permanently the competitive article.

(d) In the successful industrial combinations, the direction of motion lies in (i) increasing the ratio $C' C$; (ii) increasing the turnover, *i. e.*, making n_2 greater than n_1, which is one of the most effective lines of advance, and is the secret of the modern department store; (iii) in the reduction of e, although in several lines the opposite takes place owing to increased advertising costs, a disadvantage which is more than counterbalanced by the increases of n and p.

(h) The factor (i), the interest rate, connects every business of the country with the subject of financing. The direction of gain is plainly in the reduction of (i). Credit takes three forms, (i) the loan of goods direct; (ii) the loan of capital for short periods; (iii) the loan of capital for long periods. These forms are determined by the security of the loan, the person of the lender, the rate of interest and the duration of the loan, and not by any essential difference in the nature of the transaction.

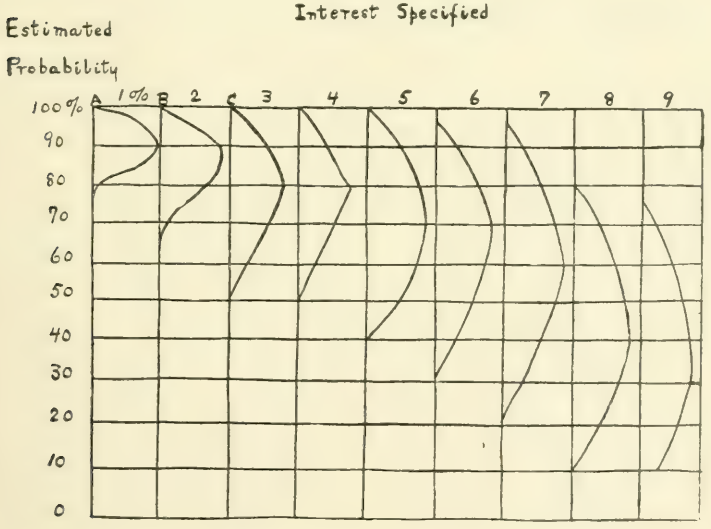
(i) In the case of the loan of goods direct, the manufacturer is the lender to the jobber, the jobber to the wholesaler, and the wholesaler to the retailer. If one per cent discount is given for payment in ten days instead of in thirty days, the rate of interest is a little above 1 per cent for twenty days, or 18 per cent per annum. This form of financing is the most expensive and is granted on the smallest security.

(ii) The loan of capital for short periods is largely the work of banking institutions and note-brokers. The security is better and the interest is lower.

(iii) The loan of capital for long periods is theoretically on still better security and at considerably lower interest rates. The lenders are investors who depend upon the interest for income. Investors will pay more for an income which is stable than for one which is intermittent, even though over a given term of years the actual total yield is the same in both cases. The reason, of course, is that the average investor lives up to his income, and a hundred dollars deducted from next year's income is not compensated by an extra hundred during the present year which by next year will have been spent.

The art of financing is, therefore, simply the capitali-

zation of the net earnings of a concern, by grading a series of loans according to diminishing security and increasing interest, or in President Hadley's words, an increasing "rate of commutation." The term "water" in securities, as it is generally used, is meaningless. Buyers and sellers base their esteem value entirely on probable rates of income and probable stability of earnings. For the entrepreneur both these hazards operate. If now, in the distribution of control of productive wealth, contracts can be drawn by which either probability can be reduced or eliminated, the security will sell on the basis of increased security. A series of skew curves will perhaps illustrate the reasoning.



The interest rates specified in the contract are written along the upper line at the heads of the columns. The distances A to B, B to C, etc., is perhaps 35 per cent in each case. Down the vertical column is the estimated joint probability of getting the given interest regularly. The

skew curves drawn in each column show how the percentage of capital for a given interest is distributed according to risk. It is plain that the area of each curve is 100 per cent, and the total amount at any interest rate and probability is the given ordinate multiplied by the total amount which loans at the given rate of interest.

The probability of obtaining the interest regularly may be approximately discovered from the statistics of earnings over past years. If the business is a stationary one, the chance of failure to pay interest is plainly determined by the difference between the average earnings and the amount required to pay the interest on the issue divided by approximately two-thirds of the standard deviation of the earnings about the average. The risk can from this data be estimated from the probability tables. For instance, if the above result is two, the probability is 4:1; if three, 19:1. This is the real reason why it is safe to capitalize combinations far in excess of cost of plant. If the business is a growing one, the same method may be adopted except a growth axis is now the basis rather than the average, and the probability of failure to pay interest a lessening one, varying with each successive year. This entire field is capable of exact statistical study, and it is in this world of probability and interest that financiers work. Their work is to provide devices for reducing the interest rates, and increasing the ratio C'/C. Thus a concern operating without credit might earn 6 per cent on a capital stock of $100,000, par value $100, with a probability of 50 per cent. The fluctuation of profits in different years might range between 4 per cent and 8 per cent. Proper financing with bonds at 4 per cent, $50,000, preferred stock 5 per cent accumulative, $40,000, would provide $90,000 capital and the bonds would have say a security of 90 per cent,

and the preferred stock 70 per cent. This would leave $10,000 for the owners of the equities to provide. Without credit, the net percentage on capital is 6 per cent. With credit, the net profit is on the average 6 per cent on $100,000 — (4 per cent on 50,000) — (5 per cent on 40,000) = 6,000 — 2,000 — 2,000 = $2,000. Two thousand dollars could be under favorable conditions capitalized at 6⅔ per cent, and the stock sell at par, *i. e.*, $32,000. The result is an excess of $22,000 of "water," and since control can be maintained with about 50 per cent ownership, the entrepreneur can withdraw all of his capital, $10,000, with his share of the water, one-half of $22,000, $11,000, and still have $1,000 clear profit and complete control. This, of course, is not far from the ideal case, where in the expression for gain through credit

$$\frac{C'}{C}(n(1+p-e)-i),$$

C is steadily diminished until it approaches zero as its limit, and C' is steadily increased to the limit of the credit market, so that the ratio C'/C nearly fulfills the dreams of some of our promoters, an infinite percentage of profit on a zero investment of capital.

(*i*) In summary, therefore, from the standpoint of the distribution of the control of productive wealth, in the line of industrial progress lie all causes or inventions which increase the ratio C'/C (from a simple book credit or personal note up to the intricate financing of the Northern Securities Co.); all causes increasing the factor n (such as time saving processes of manufacturing, advertising and efficient organization); also the factor (p) (for instance special brands which admit of monopoly prices, or that constancy of price schedules, which wide control affords); and to decrease (e) and (i) is also

profitable. Time saving processes and the economic handling of labor as well as the elimination of useless labor, such as competing salesmen, suffice to lower (*e.*) Finally, high finance with its long series of credit instruments, ranged in gradation of increasing security and decreasing interest accomplishes the latter. Indeed, the attitude that credit extension is unproductive seems to me very wide of the mark. The devices which quickly enable the men who can to enter upon the work to which capability has pointed, have arisen not without reason.

To my mind, the situation calls not so much for publicity with respect to the statistics of the private information of the entrepreneur, which is of the nature of patent right and of less value to the public, who cannot analyze, than to the rival who analyzes to complete, as for a campaign of education, which shall teach the advantages and disadvantages of credit instruments from the investor's standpoint with sharp emphasis on the great hazards of common stock, and especially on how very little a common stockholder has a right to expect.

THE THEORY OF LOAN CREDIT IN RELATION TO CORPORATION ECONOMICS—DISCUSSION

FREDERICK A. CLEVELAND: To state the points briefly and concisely, my objections to the method employed by Dr. Norton are two: (1) that the method used for reaching his conclusions is unscientific; and (2) that the method of presenting his results is not one which may be readily understood by the economists themselves with whom it is necessary to co-operate in the development of a science, nor is it readily intelligible to the public in whose education we are primarily interested. These objections will be presented in the order suggested.

The logical method by which Dr. Norton reaches his conclusions is entirely *a priori*. Such a process of reasoning is entirely proper when applied to mathematics or to the development of any scheme of thought from premises which are well established, and concerning which there can be no dispute nor objections raised by those to whom this form of reasoning is addressed. Dr. Norton, in his paper, however, has attempted to apply *a priori* processes of reasoning to assumptions which are neither established, nor can they be admitted for the sake of argument without doing violence to the subject which he is seeking to unfold. For example, his most fundamental conclusion which is used as a basis for further *a priori* reasoning is that competition does not enter into the prices of monopoly goods. This assumption or conclusion is not a generally accepted one—in fact the position taken has been a subject of heated discussion among economists themselves, and certainly

would not be accepted by men in the business world as established.

Mathematical reasoning is wholly *a priori*; but the truth of mathematical conclusion depends entirely on the truth and general acceptance of its premises. To attempt to apply mathematical reasoning to assumptions that are not accepted, and concerning which there has been no conclusive demonstration as to the truth, can result in nothing but a waste of energy on the part of the one making the application of the method to the development of his subjects, and a waste of time on the part of those who attempt to follow the development. It is for the reason that no broad generalizations have been established, and that none will be admitted without question, that the *a priori* method alone cannot be used for the unfolding of a science. It is in those branches of knowledge only where research has been applied as the method of inquiry, and where *a priori* reasoning has been employed simply as a guide to research, that progress has been made.

In economics the method of the past has been one of reasoning from primary assumption to a further conclusion. The scientific method seems not to have won a place among those who have devoted themselves to the field of economic inquiry. The result is that there has not to this time been established a single conclusion that may be accepted without controversy, even by economists themselves. It is this fact that makes futile the method of Dr. Norton and of all others who seek to apply mathematical or other forms of *a priori* reasoning alone to constructive thought in the field of business. Before we can ever hope to develop a systematic body of knowledge which will win for itself the confidence of the thinking world, the method of scientific

research—that method of reasoning which treats present generalizations purely as working hypotheses, and which from these goes out into the business world and attempts to assemble and classify the data around these hypotheses—a method which refuses to accept any conclusion as a basis for reasoning without again bringing that reason to the basis of scientific proof must be invoked by the economist.

The second objection urged by way of criticism to the paper under discussion pertains to the method of presentation. If the assumption heretofore made that a science must be the result of co-operative effort, and further, that the purpose of scientific investigation is to impart information, then it follows that one who is seeking to contribute to the present sum of existing knowledge should present the results of his labor in such form as to permit those working with him to avail themselves of the results with greatest facility; the form of presentation should be one which most readily appeals to the intelligence of the class to whom it is addressed.

If we assume that the paper under discussion was addressed to economists, then the form of presentation should be one that would be readily understood by economists. Again, if it were addressed to the public it should be stated in a language familiar to the public. I do not think that I would be thought to be hypercritical if attention were called to three characteristics in which the paper of Dr. Norton did not seem to conform to the purpose as above expressed, viz: (1) That in certain parts a nomenclature has been used which is not common within the field of economics itself, and is not at all understood by the public. (2) that the use made of diagramatic emblems does not lend clearness to

the exposition. (3) that mathematical formulae are not a language that can be readily followed, and therefore is not one which the economists or the public at large can follow with facility.

As to the nomenclature used, and to which reference is made, I may cite the following: "Weber's law suggests that on the assumption of equality of enjoyment, equality of properties maximizes this ophelimity." The meaning of this clause to most readers even in the field of economics would be absolutely lost, whereas, the same idea might be very easily expressed in terms that are in ordinary and general use. As to the diagramatic representation of thought presented, there are few people who are accustomed to think in terms of "skew curves," etc.; to most readers no idea is conveyed by such a device. If after hours of serious thought the message which the writer has to convey may be drawn from the context, it is at the cost of time and effort greater than most readers will be willing to give. It is suggested that the same ideas might be expressed without this lumbering method of expression—an expression entirely plain and clear to one who has become an expert in the handling of obscure terms, ingenious diagrams and mathematical formulæ, but which stand in the way of conveying ideas to economists and to others who have been accustomed to think about similar problems, and to express their thought in a different way. As to the resort made to mathematical formulae there is nothing in the subject handled which requires such a presentation, and therefore, it is suggested that this method of conveying thought on the subject is one least intended to make whatever results have been obtained, useful to others.

These criticisms would not be offered, in Dr. Norton's

absence, were they not intended as a protest against the whole class of economic writings for which the paper before us stands as an example. To be more specific it is urged: (1) that the field of business, both public and private, is capable of scientific treatment—that the facts may be collected, classified and co-ordinated, and that scientific conclusions may be reached in this branch of inquiry as well as in physiology, anatomy and botany; (2) that the *a priori* method which begins by taking for granted certain broad generalizations, and from these first assumptions projects reason out into intellectual space is not a method by which a science of economics may be developed; (3) that those who have turned from the usual method of expression to mathematics are simply employing symbols and forms to make the reason itself more exact, but by this can add absolutely nothing unless each hypothesis is brought to the test of scientific research, and this the mathematical economists have failed to do; (4) that this form of erudition, based as it is solely on philosophic reflection and a long line of purely empirical reasoning, when so stated as to be readily understood, must still put the reader to the task of making a scientific test of its conclusions and therefore can be of little value; but when it also attempts to express itself in symbols and signs unusual or which first require translation, it so far compounds the difficulty as to make the result entirely questionable. Working from a few commonplace assumptions the economists have for two centuries been building their tower of Babel. Gradually they have risen from one premise to another; but not having a method of inquiry which has brought them into intellectual co-operation, each has followed his own line of projection, and each from his own high pedestal talking in a language

peculiar to himself has addressed himself to his own imaginary audience, until they can no longer understand each other. By men of affairs (those who have some knowledge of economic data) to use the language of a recent review, "they are regarded as mere pedants and pundits beating their ineffectual wings in a void of of their own creation." Should the economist forsake the method of our primitive philosophies, and accept the method of modern science, the business men would be first to welcome his results; and gradually a science of economics would rise to the plane of history, chemistry, physics and the other established branches of exact knowledge.

STATE TAXATION OF INTERSTATE COMMERCE

FRANK J. GOODNOW

The question as to the constitutionality of the taxation of interstate commerce by the states could not very well arise in the early history of the country. There were no such things as interstate transportation companies. There were hardly any interstate or state roads. Furthermore, the expenses of the state governments were, on account of the modest character of the work they did, very small in amount, and these expenses could easily be met by the taxes which were universally levied on property and on occupations. The first attempt made by any state which led to litigation was that of the state of Maryland to charge a fixed sum for every coach passing over the national road. The propriety of such a tax came up before the Supreme Court of the United States, which decided against the state, not however on the ground that the taxation by a state of interstate commerce was prohibited by the Constitution, but on the ground that the particular action taken by the state of Maryland was in violation of a contract made by it with the United States. (See *Searight* vs. *Stokes*, 3 How. 151.)

Before the question as to the power of the states to tax interstate commerce came up definitely before the Supreme Court, that body had so construed the commerce clause of the Constitution as to make it extremely probable that the court would decide that the taxation of interstate commerce by the states was improper. This commerce clause gives to Congress the power "to regulate commerce with foreign nations and among the

several states and with the Indian tribes." The Supreme Court had, early in its history, decided that by this clause an exclusive power of regulation as to all matters needing uniform and not admitting of local treatment, was vested in Congress. In the great case of *Gibbons* vs. *Ogden* (9 Wheat. 1), decided in 1824, the Supreme Court denied the right of the state of New York to grant an exclusive right of steam navigation on the Hudson River. Chief Justice Marshall intimated that this power was exclusively in Congress, saying:

"It has been contended by the counsel for the appellant that, as the word 'to regulate' implies in its nature full power over the thing to be regulated, it excludes, necessarily, the action of all others that would perform the same operation on the same thing. . . There is great force in this argument, and the Court is not satisfied that it has been refuted."

At the same time Mr. Justice Marshall says expressly that the decision of this question was not necessary in order to decide the case before the court, for the reason that the action of the state was in conflict with that of Congress and was, therefore, improper.

In the later case of *Cooley* vs. *Board of Port Wardens* (12 How. 300), decided in 1851, state regulations relative to pilots were upheld. Mr. Justice Curtis, who gave the opinion of the court, says:

"It becomes necessary, therefore, to consider whether this law of Pennsylvania, being a regulation of commerce, is valid. The act of Congress of the 7th of August, 1789, sect. 4, is as follows:

"That all pilots in the bays, inlets, rivers, harbors and ports of the United States shall continue to be regulated in conformity to the existing laws of the states, respectively, wherein such pilots may be, or with such laws as the states may respectively hereafter enact for the purpose, until further legislative provision shall be made by Congress.

"If the law of Pennsylvania now in question had been in existence at the date of this act of Congress, we might hold it to have been adopted by Congress, and thus made a law of the United States, and so valid. Because this act does, in effect, give the force of an act of

Congress to the then existing state laws on this subject, so long as they should continue unrepealed by the state which enacted them. But the law on which these actions are founded was not enacted till 1803."

Mr. Justice Curtis, therefore, comes to the conclusion that the act of the state of Pennsylvania could not be justified as having been adopted by Congress. Later on in the opinion Mr. Justice Curtis says:

"Whatever subjects of this power are in their nature national, or admit only of one uniform system, or plan of regulation, may justly be said to be of such a nature as to require exclusive legislation by Congress. That this cannot be affirmed of laws for the regulation of pilots and pilotage is plain. The act of 1789 contains a clear and authoritative declaration by the first Congress that the nature of this subject is such, that until Congress should find it necessary to exert its power, it should be left to the legislation of the states; that it is local not national; that it is likely to be the best provided for, not by one system or plan of regulations, but by as many as the legislative discretion of the several states should deem applicable to the local peculiarities of the ports within their limits."

On the basis of this reasoning the court upheld the act of Pennsylvania in question.

Somewhat later in its history the court extended the principle of the exclusiveness of the power by adding the corollary that when Congress had failed to exercise its power, it had done so because it was its will that the commerce subject to its regulation should not be regulated. This view is hinted at by Mr. Justice Johnson in the case of *Gibbons* vs. *Ogden* and by Mr. Justice Grier in the *Passenger Cases* (7 How. 283), decided just before (1849), and is definitely adopted by the Supreme Court in the case of the *State Freight Tax* (15 Wall. 232), decided in 1872. The principle is brought out as clearly as anywhere in *Robbins* vs. *Shelby County Taxing District* (120 U. S. 489), decided in 1886.

Finally it was also decided at an early time that taxation was regulation. The first hint that this was to be

the view to be taken is to be found in Chief Justice Marshall's opinion in *Brown* vs. *Maryland* (12 Wheat. 419), decided in 1827. The first case, however, which definitely places the Supreme Court on record on this point is the *Passenger Cases* (7 How. 283), where the order of the court was that

"It is the opinion of this court that the statute law of New York, by which the health commissioner of the city of New York is declared entitled to demand and receive, from the master of every vessel from a foreign port that should arrive in the port of said city, the sum of one dollar for each steerage passenger brought in such vessel, is repugnant to the Constitution and laws of the United States, and therefore void."

This decision resembled the late decision in the *Insular cases* in that while there was a decision there was no opinion, almost every member of the court writing his own opinion. Among the dissenting opinions is that of Chief Justice Taney, who denies that taxation is regulation, saying:

"The taxing power of the state is restrained only where the tax is directly or indirectly a duty on imports or tonnage. And the case before us is the first in which this power has been held to be still further abridged by mere affirmative grants of power to the general government. In my judgment this restriction on the power of the states is a new doctrine in opposition to the contemporaneous construction and the authority of adjudged cases. And if it is hereafter to be the law of this court, that the power to regulate commerce has abridged the taxing power of the states upon the vehicles or instruments of commerce, I cannot foresee to what it may lead; whether the same prohibition, upon the same principle, may not be carried out in respect to ship-owners and merchandise in a way seriously to impair the powers of taxation which have heretofore been exercised by the states."

Notwithstanding the dissent from this position, the principle was upheld, and nothing is clearer at the present time than that taxation of commerce is regulation of commerce.

It may, therefore, be said that before the question of the regulation of commerce among the states came up

for consideration, certain principles had been adopted by the Supreme Court with regard to that part of the clause which affected commerce with foreign nations. It was only natural, therefore, that when the matter of commerce among the several states did come up for consideration, the principles which had been applied to commerce with foreign nations should be applied to commerce among the several states, for the power with regard to both kinds of commerce was to be found in the same clause. At the same time it is well to remember that, while the Constitution contains nothing further with regard to commerce among the several states, it does contain a number of provisions which positively prohibit action on the part of the states relative to commerce with foreign nations. Thus the Constitution in article 1, section 10, forbids a state to enter into any treaty, alliance or confederation or agreement or compact with another state or with a foreign power, or, without consent of Congress, to lay any imposts or duties on the imports or exports, except what may be absolutely necessary for executing its inspection laws.

It is thus seen that the views expressed with regard to the taxation of foreign commerce may have been influenced not merely by the commerce clause, but as well by these other clauses of the Constitution. Indeed it is very evident that Chief Justice Marshall's opinion in *Brown* vs. *Maryland* must be read in the light of the prohibition placed upon the states to tax imports as well as in that of the commerce clause.

But however that may be, certain principles which had been adopted with regard to commerce with foreign nations were actually later applied to commerce among the several states. These were, that the power of Congress to regulate was exclusive as to all matters which

admit of uniform regulation; that, as to such matters, the inaction of Congress was to be regarded as an expression of its will that there should be no regulation; that, as to matters which do not admit of such uniform regulation, the states might act until Congress acted, and, finally, that taxation was regulation.

What remained to be determined then was, what was commerce among the several states. It has already been said that in our early history there was no particular need of taxing such commerce. With, however, the development of great interstate transportation companies whose ownership was widely distributed among their security holders, there sprang into existence an immense amount of personal property which did not subject itself so readily to the taxing power of the state as had the tangible personal property which, prior to the development of corporate securities, had constituted a large, if not the largest, part of the personal property subject to taxation. Further, the development of industrial civilization imposed greater burdens upon the states, which, in order to protect the weaker classes of the community, had to extend their sphere of governmental activity. The growth of cities had the same effect. City government became necessarily more expensive. The industrial states first attempted to solve this problem by assigning the real property taxes to the localities and by securing new state revenues from the various corporations which had sprung up and flourished through the grant to them of privileges by the states in which they conducted their operations.

Pennsylvania seems to have taken the lead in this movement which began, roughly speaking, about 1870. No attempt will here be made to give an account of the movement. Lack of space forbids. All that can be said

is that among other corporations the transportation corporations were subjected by the states to various forms of taxation, which resulted in a vast amount of litigation before the Supreme Court. This body has not always been consistent in the opinions which have been officially expressed by its representatives. At the same time its decisions are, it is believed, with very few exceptions susceptible of reconciliation, if attention is directed to the exact facts of the cases rather than to the expressions of opinion on the part of the judges. The result of these decisions is somewhat as follows:

First. License taxes imposed upon commercial houses of other states or on corporations engaged in interstate commerce for the privilege of selling within the state goods to be brought from other states or of conducting a business which transcends state lines are forbidden. The following license taxes have been held to be improper. (1) License taxes to sell in the state goods of foreign origin, imposed on the seller because of the foreign origin of the goods; (2) license taxes imposed upon drummers who come into the state to solicit orders for a foreign house, where the goods ordered are outside of the state at the time of the sale; (3) license taxes imposed upon telegraph or transportation companies for the privilege of sending messages outside of the state, or for shipping goods out of the state. (See *Welton* vs. *Missouri*, 91, U. S. 275; *Robbins* vs. *Shelby County*, 120 U. S. 489; *Telegraph Co.* vs. *Texas*, 105 U. S. 460; *Leloup* vs. *Port of Mobile*, 127 U. S. 640; *Norfolk & Western Ry. Co.*, vs. *Pennsylvania*, 136 U. S. 114).

Second. Taxation of the objects of interstate commerce, that is, objects which are being transported from any point not within the state to another point not within the state, or from a point within the state to a point not

within the state or *vice versa*, is a regulation of interstate commerce and therefore prohibited (*State Freight Tax*, 15 Wall. 232).

Third. Taxes imposed upon the gross receipts of a corporation, where such receipts include receipts from interstate commerce as above defined, are justifiable only where the receipts taxed are not entirely derived from interstate commerce, and where the corporation is a domestic corporation, that is, a corporation of the taxing state. Where the receipts of a domestic corporation are not derived entirely from interstate commerce, its gross receipts may be made the measure of a tax, which is regarded as a tax upon its franchise. This franchise is considered by the courts as subject to the jurisdiction of the state, because it is granted by the state. (*Railway Gross Receipts Tax case*, 15 Wall. 284; *Philadelphia & Southern Steamship Co.* vs. *Pennsylvania*, 122 U. S. 326; *Fargo* vs. *Michigan*, 122 U. S. 326; *Ratterman* vs. *Western Union Telegraph Co.*, 127 U. S. 411; *Maine* vs. *Grand Trunk Railway Co.*, 142 U. S. 217).

These rules, effectively precluded the states from taxing the right to carry on interstate commerce, the objects of interstate commerce and the receipts from interstate commerce except in the one case that the corporation whose receipts were taxed was a domestic corporation and those receipts were derived only partially from interstate commerce. The states may therefore be said to have failed pretty nearly all along the line in their attempts to tax corporations engaged in interstate commerce, where the tax was attempted to be levied on that commerce. The states, however, were not daunted by this failure, but started on a new line about the year 1880.

In the great case of *McCullough* vs. *Maryland* (4 Wheat. 316), in which it was decided that the states could not tax the operations of an instrumentality of the United States government, Chief Justice Marshall had said:

"This opinion does not deprive the States of any resources which they originally possessed. It does not extend to a tax paid by the real property of the bank, in common with the other real property within the State, nor to a tax imposed on the interest which the citizens of Maryland may hold in this institution, in common with other property of the same description throughout the State. But this is a tax on the operations of an instrument employed by the government of the Union to carry its powers into execution. Such a tax must be unconstitutional."

When the transcontinental railway corporations resisted state taxation on their property on the ground that they were agencies of the United States government, the Supreme Court applied the exception made by Chief Justice Marshall and upheld the right of the states to levy these taxes. (*Thomson & Pacific Railroad Co.*, 9 Wall. 579; *Railroad Co.* vs. *Peniston* 18 Wall. 5).

In the meantime the states had gradually adopted the view that railway property was to be assessed as railway property and not as so much land, with the rails, ties and so on annexed to it. Such a method of assessment was upheld by the Supreme Court in the *State Railroad Tax cases* (92 U. S. 575). The states soon saw that if they could extend this principle somewhat they could arrive at the same result which they had tried to reach when they began the movement to which reference has been made.

One of the first important cases which upheld the states in their action was the *Western Union Telegraph Co.* vs. *Massachusetts* (125 U. S. 530), decided in 1887. Here it was held proper for the state to tax

that proportion of the valued capital stock of the company which the number of miles of telegraph line operated by such company in Massachusetts bore to the total number of miles operated by the company. This method was soon applied to other corporations doing an interstate business, particularly the railways (see the *C. C. C. & St. Louis R'y Co.* vs. *Backus*, 154 U. S. 439), and the express companies. The extreme point to which this unit of value theory, as it came to be called, was carried is seen in the *Express Company cases* (165 U. S. 194), decided in 1896. In these cases the only property possessed by the companies subject to the tax consisted of property similar to that possessed by ordinary citizens of the state, that is, horses, wagons, safes, pouches, office furniture and so on, but the Supreme Court, in a decision from which four of the nine judges dissented, held that this property might be given a value which was to be based almost exclusively upon the receipts which its use by the company secured, with the result that property of an actual taxable value, when considered apart from the business in which it was used, of less than $70,000 was assessed at more than $500,000.

The theory of the situs of the property, which must be within the state in order that the state might have jurisdiction to tax, was stretched in other cases almost as far as the power of the state to tax the property of the agents of interstate commerce was extended in the *Express Company cases.* This comes out most clearly in the *Pullman Company cases.* The Supreme Court had held under its theory of license taxes that a specific tax on the cars of a foreign corporation cannot be imposed for the privilege of engaging in interstate commerce (*Pickard* vs. *Pullman Southern Car Co.* 117

U. S. 34). The state of Pennsylvania, however, advanced the theory that while the specific cars of a foreign corporation cannot be said to be within the state where such cars are merely running through the state, at the same time, since there is always a certain number of cars within the state, the state may tax that proportion of the capital stock of the corporation which the miles run by the company's cars within the state bear to the total number of miles run by the cars in the country as a whole. This view received the approval of the Supreme Court. (*Pullman Palace Car Co.* vs. *Pennsylvania*, 141 U. S. 18).

We may say, therefore, *1st*, that the fact that a transportation company has, at all times, some property within a state, is sufficient to give such state jurisdiction for taxation, and, *2d*, that such property may be assessed, not as ordinary property, in the state, in accordance with its value as an item of such property, but as a part of a whole, whose value is determined by the receipts from operations of that whole, notwithstanding those operations are operations of interstate commerce. This is really the principle at the basis of the unit of value doctrine. It is not in accordance with the distinction made by Chief Justice Marshall in *McCullough* vs. *Maryland*, on which the right to tax the property of agencies of interstate commerce is based, and it results, however we may attempt to cloak it in fanciful distinctions, in a taxation of interstate commerce.

The question may well be asked, then, what advantages have been secured by this circuitous method of recognizing that the states may tax interstate commerce. It is certainly no less dangerous to the commercial unity of the United States which the Consti-

tution attempted to ensure, that the states should tax the value of the property of interstate corporations, estimated in terms of the receipts from interstate commerce, than that they should tax the receipts themselves, or even the objects of interstate commerce. Why is it that the Supreme Court has thus practically reversed its policy? Why, but because, as Chief Justice Taney intimated in in his opinion in the *Passenger cases* already referred to, the restriction of the power of the states, as it has been interpreted, has too seriously impaired "the powers of taxation which have heretofore been exercised by the states."

This fear that the taxing power of the states would be too greatly impaired has been voiced by many of the judges, but they have been led to adopt the principles which they have enunciated, by the fear that if they recognized the power to tax interstate commerce as belonging to the states, it could be made use of to destroy our commercial unity. For the power to tax is the power to destroy, as Chief Justice Marshall said in *McCullough* vs. *Maryland*. This fear has been expressed many times. Thus in the *State Freight Tax cases* (15 Wall. 232), Mr. Justice Strong says:

"The legislature of Pennsylvania has in effect declared that every ton of freight taken up within the State and carried out, or taken up in other States and brought within her limits, shall pay a specified tax. The payment of that tax is a condition, upon which is made dependent the prosecution of this branch of commerce. And as there is no limit to the rate of taxation she may impose, if she can tax at all, it is obvious the condition may be made so onerous that an interchange of commodities with other States would be rendered impossible. . . It is of national importance that over that subject (that is, interstate commerce) there should be but one regulating power, for if one state can directly tax persons or property passing through it, or tax them indirectly by levying a tax upon their transportation, every other may, and thus commercial intercourse between States remote from each other may be destroyed. The produce of Western States may thus be effectually excluded from Eastern markets, for though it

might bear the imposition of a single tax, it would be crushed under the load of many. It was to guard against the possibility of such commercial embarrassments, no doubt, that the power of regulating commerce among the States was conferred upon the Federal government."

Again, in the case of *Welton* vs. *Missouri*, (91 U. S. 275), Mr. Justice Field says:

"The power of the state to exact a license tax of any amount being admitted, no authority would remain in the United States or in this court, to control its action, however unreasonable or oppressive."

Is there now no way of reconciling these two desiderata, that is, an ample taxing power in the states and an absolutely secure commercial unity for the entire country? Certainly the present solution of the question does not ensure such a unity, for the states may at any time they see fit increase their exactions, and unless the Supreme Court changes its rule, no Federal authority can intervene to protect interstate commerce. If, on the other hand, the Supreme Court does change its rule, while our commercial unity will be protected the taxing power of the states will be too greatly impaired. The mere statement of the question would seem to suggest its answer. This is the recognition of a right on the part of the states to tax interstate commerce, the exercise of which should be limited by Congress. Is, now, such a solution of the question constitutional? At first blush one is apt to say "no," but a further investigation of the subject is calculated, it is believed, to cause doubts to arise as to whether "no" is the right answer. It is to be noticed that the states are not expressly forbidden by the Constitution to regulate or tax interstate commerce, as they are expressly forbidden to levy taxes on imports or exports. Therefore, the taxation of interstate commerce by the states is improper only so far as it is within the state regulation of such commerce, which

is forbidden by the Supreme Court in its interpretation of the commerce clause of the Constitution. But we have seen that state regulation of such commerce is forbidden, except as to such local matters as pilot regulation, and that taxation is regulation. Must we, then, conclude that state taxation of interstate commerce is, in all cases, improper?

Not if we bear in mind the old maxim of the law which says that when the reason for a rule ceases the rule itself ceases. What, now, is the reason for the rule that state taxation is regulation? Is it not, as has already been intimated, that the power to tax is not subject to judicial limitation, but, if recognized, may be exercised to any extent? This is what the Supreme Court has said on several occasions. If, now, we can find a method by means of which the exercise of this power by the states can be limited by Congress, is it not natural to suppose that the objections of the Supreme Court to state taxation of interstate commerce will be removed? Several constitutional objections to such a solution of the question at once present themselves. It will be said that if the states possess the power, Congress has no constitutional authority to limit their exercise of it, and on the other hand, that if the states do not possess the power Congress may not delegate it to them. Is it, however, necessary to concede that congressional limitation of state taxation is either a limitation of the power of the states to tax or a delegation to the states of a power which they otherwise would not possess? The attempt will be made to show that an act of Congress could be framed which would not be open to either of these objections.

Suppose Congress should frame an act which should provide a method of state taxation of interstate com-

merce, to go into effect in any state if that state should adopt the act of Congress. Such an act might be justified on either one of two theories; first, the adoption by Congress of a state law; second, the passage of legislation by Congress to take effect on the happening of a future event. Let us see now whether either or both of these methods has received the approval of the Supreme Court.

The first case decided by that body which has a bearing on the theory that Congress may adopt a state law is the case of *Cooley* vs. *Port Wardens*, already referred to. The opinion in this case would seem to show, however, that the Supreme Court has repudiated the idea that Congress can provide for the adoption by it of legislation to be passed in the future by the states. In order to uphold the state statute the court was driven to take the position that the power to regulate commerce is exclusive in Congress only as to subjects which are "in their nature national or admit only of one uniform system or plan of regulation," and that as to local matters the states may act until Congress acts. At the same time it is to be remembered that the court did not declare the act of Congress unconstitutional and also upheld the law of the state passed after the act of Congress. A careful search through the reports has revealed no other decision on this point until we come to the year 1890, when the case of *In re Rahrer* (140 U. S. 545) came before the court. This case brought up for consideration an act of Congress known as the Wilson Bill. This provided

"That all fermented, distilled or other intoxicating liquors transported into any state or territory, or remaining therein for use, consumption, sale, or storage therein, shall, upon arrival in such state or territory, be subject to the operation and effect of the laws of such state or territory, enacted in the exercise of its police powers, to

the same extent and in the same manner as though such liquors or liquids had been produced in such state or territory, and shall not be exempt therefrom by reason of being introduced therein in original packages or otherwise."

The purpose of this bill was to overcome the effect of the decision of the Supreme Court in the case of *Leisy* vs. *Hardin* (135 U. S. 100), which had held that liquors in the original package in the hands of the person bringing them into the state would not be subject to the police power of the state. The court upheld the law of Congress and affirmed the conviction of a person selling liquor in the original package which he had brought from another state, contrary to the law of the state of Kansas. In the course of the opinion Mr. Chief Justice Fuller denies that such an act is a delegation of power to the state, saying,

"Congress did not use terms of permission to the state to act, but simply removed an impediment to the enforcement of the state laws in respect to imported packages in their original condition, created by the absence of a specific utterance on its part. It imparted no power to the state not then possessed, but allowed imported property to fall at once upon arrival within the local jurisdiction."

Again he says:

"No reason is perceived why, if Congress chooses to provide that certain designated subjects of interstate commerce shall be governed by a rule which divests them of that character at an earlier period of time than would otherwise be the case, it is not within its competency to do so.

"The differences of opinion which have existed in this tribunal in many leading cases upon this subject, have arisen, not from a denial of the power of Congress, when exercised, but upon the question whether the inaction of Congress was in itself equivalent to the affirmative interposition of a bar to the operation of an undisputed power possessed by the states.

"We recall no decision giving color to the idea that when Congress acted its action would be less potent than when it kept silent.

"The framers of the Constitution never intended that the legislative power of the nation should find itself incapable of disposing of a subject matter specifically committed to its charge. The manner of that disposition brought into determination upon this record involves no ground for adjudging the act of Congress inoperative and void."

Three Justices, namely, Harlan, Gray and Brewer did not, indeed, concur in all the reasoning of the opinion of the court, but they wrote no dissenting opinion. The decision was therefore a unanimous decision of the court.

It is true that the act of Congress considered in this case was passed after the law of Kansas was adopted, but this fact is made no account of by the Supreme Court, which bases its decision upon general principles. It may, therefore, be said that there is ground for believing that Congress has the power in certain cases to adopt either existing or future state legislation as its own.

But even if it is not believed that the decisions referred to go to the extent of recognizing the power of Congress to adopt future state legislation, the acceptance of such a principle is not necessary to the validity of the plan for Congressional action, which has been proposed. For what this plan involves is the preparation of a complete system of taxation by Congress, which shall take effect in a particular state on the adoption of it by such state. Such a power is clearly distinguished by the Supreme Court from the power of delegating functions of government. Thus, it has been decided in the case of *Field* vs. *Clark* (143 U. S. 649), which upheld the reciprocity provision of the Tariff act of 1890, that Congress might give to the President the power, in given conditions, the existence of which he was to determine, to strike articles from the free list, provided by the tariff, in which case certain rates of duty provided for as well in the act of Congress, were to be levied. The Supreme Court held that this was not a delegation of legislative power by Congress to the President and was perfectly constitutional. Such also has been the effect of the decisions in many of the state courts relative to

the constitutionality of various local option laws, adopted by many of the states, which make the going into effect of a law prohibiting the sale of liquor in a particular locality dependent upon the vote of the people of that locality.

What difference is there then between providing for the going into effect under special conditions, to be determined by the President, and providing for the going into effect in a particular state of a law of Congress, in case the state legislature shall come to the determination that the going into effect of such a law is expedient. Of course such a law would be improper relative to foreign commerce, for the states are expressly forbidden to impose duties upon exports or imports. But in the case of interstate commerce, all the Constitution says is that Congress shall have power to regulate, and such action of Congress as has been proposed would not cease to be regulation by Congress because it was provided that it should go into effect in any state only when such state should decide to put it into effect.

In addition to the decisions mentioned, there are a number of other decisions which have upheld acts of Congress similar to the one proposed. Thus, soon after the establishment of the national banking system, it was provided by Congress that the shares of the national banks might be taxed by the states in the hands of shareholders, as personal property, subject to specific limitations. It was objected to this that it was an attempt on the part of Congress to delegate power to the states, but the Supreme Court held (*Van Allen* vs. *Assessors*, 3 Wall. 573) that the act of Congress was not a delegation of legislative power to the states. The opinion upholds this legislation, it is true, on the theory on which pilot regulations by the states have been upheld.

The fact remains, however, that the Supreme Court, in the case mentioned, upheld an act of Congress which went into force in a state only as a result of action on the part of the state. (See also *Tappan* vs. *Merchants Bank*, 19 Wall. 490).

Another similar instance of an act of Congress controlling the legislation of the states is to be found in the United States Revised Statutes, which, as interpreted by the Supreme Court, fixed the situs for purposes of state taxation of vessels registered with the United States. The Supreme Court has held that the situs of this class of property is the home port and that the states may not change it. (See *Hays* vs. *Pacific Mail S. S. Co.* 17 How. 596; *Morgan* vs. *Parham*, 16 Wall. 471).

It will thus be seen that an act of Congress which should provide a system of state taxation of interstate commerce to go into effect in any state in case of affirmative action on the part of such state would have considerable precedent in favor of its constitutionality.

The only remaining question to be asked is, would Congress have the power to prevent the states from adopting some other system than the one provided? This question is one of more difficulty. Unless the Supreme Court abandons the unit of value rule, it is hardly conceivable that Congress could prevent the states from taxing these interstate commerce corporations according to that theory. But it is to be remembered that this rule was adopted by a divided court. In the *Express Company cases*, in which the extreme position of the court was taken, four of the nine judges dissented on the ground that the tax imposed was really on interstate commerce. There is reason to expect, therefore, that

the Supreme Court may modify, if not reverse, its decision. If it does and adopts the rule that taxation by the state of property belonging to corporations engaged in interstate commerce is the taxation of interstate commerce, where the value of such property for the purposes of taxation is reached from a consideration of the receipts obtained from its use as an instrument of interstate commerce, the answer to the question which has been put will be much easier. Indeed, we already have a number of decisions which indicate the probable attitude which the Supreme Court would take. In the *Bank Tax cases*, already cited, that body held an act of the state of New York imposing a tax on national bank shares invalid because it did not provide that such shares should be taxed at the same rate as other moneyed capital, as required by the act of Congress authorizing the states to tax such shares. Besides this case, there are a number of cases preventing states from assessing such shares at a higher ratio of their true value than other personal property on the same roll (*Pelton* vs. *Bank*, 101 U. S. 143), or from refusing to the individual holder of such shares the right to deduct his debts from the assessment on his shares, where this privilege was given to the holders of other personal property liable to taxation (*Boyer* vs. *Boyer*, 113 U. S. 689.)

Finally, in a very recent case (*Owensboro National Bank* vs. *Owensboro*, 173 U. S. 664), decided in 1898, the Supreme Court has held that the states may not tax national banks except in the way provided by Congress. Mr. Justice White says:

"The tax then, as defined in the law, as interpreted by the Court of Appeals of Kentucky, and by this court in the opinions from which we have excerpted, is a tax nominally on the franchise of the corporation, but in reality a tax on all the intangible property of the corporation. The proposition then comes to this: Nothing but the shares of stock in the hands of shareholders of a national bank can be taxed,

except the real estate of the bank. The taxes which are here resisted are not taxes levied upon the shares of stock in the names of the shareholders, but are taxes levied on the franchise or intangible property of the corporation. Thus, bringing the two conclusions together, there would seem to be no escape in reason from the proposition that the taxing law of the State of Kentucky is beyond the authority conferred by the act of Congress, and is therefore void for repugnancy to such act."

Again he says:

"It follows then necessarily from these conclusions that the respective states would be wholly without power to levy any tax, either direct or indirect, upon the national banks, their property, assets or franchises, were it not for the permissive legislation of Congress. . . This section, then, of the Revised Statutes is the measure of the power of a state to tax national banks, their property or their franchises. . . . Any state tax, therefore, which is in excess of and not in conformity to these requirements is void."

It will be observed that in this case the Supreme Court abandons (there is no dissent from the judgment or opinion) the position taken in the *Bank Tax cases*, that the power to tax national banks is concurrent, but definitely puts itself on the ground that the states have no power to tax national banks in any way unless authorized by Congress, and that if they tax such institutions they must tax them in the way, and only in the way so authorized. In another and earlier case (*Mercantile National Bank* vs. *Mayor*, 121 U. S. 138), decided in 1886, the Supreme Court gives its conception of the reasons which actuated Congress in passing the act permitting the taxation of national banks. Mr. Justice Matthews says:

"The key to the proper interpretation of the act of Congress is its policy and purpose. The object of the law was to establish a system of national banking institutions, in order to provide a uniform and secure currency for the people and to facilitate the operations of the Treasury of the United States. The capital of each of the banks in this system was to be furnished entirely by private individuals; but, for the protection of the government and the people, it was required that this capital, so far as it was the security for its circulating notes, should be invested in the bonds of the United States. These bonds were not subjects of taxation; and neither the banks themselves, nor

their capital, however invested, nor the shares of stock therein held by individuals, could be taxed by the states in which they were located without the consent of Congress, being exempted from the power of the states in this respect, because these banks were means and agencies established by Congress in execution of the powers of the government of the United States. It was deemed consistent, however, with these national uses, and otherwise expedient, to grant to the states the authority to tax them within the limits of a rule prescribed by the law. In fixing those limits it became necessary to prohibit the states from imposing such a burden as would prevent the capital of individuals from freely seeking investment in institutions which it was the express object of the law to establish and promote. The business of banking, including all the operations which distinguish it might be carried on under state laws, either by corporations or by private persons, and capital in the form of money might be invested and employed by individual citizens in many single and separate operations forming substantial parts of the business of banking. A tax upon the money of individuals, invested in the form of stock in national banks, would diminish their value as an investment and drive the capital so invested from this employment, if at the same time similar investments and similar employments under the authority of state laws were exempt from an equal burden. The main purpose, therefore, of Congress, in fixing limits to state taxation on investments in the shares of national banks, was to render it impossible for the state, in levying such a tax, to create and foster an unequal and unfriendly competition, by favoring institutions and investments of a similar character. The language of the act of Congress is to be read in the light of this policy."

What rules of law now are we to gather from this rather tedious collection of excerpts from the decisions, as to the power of Congress to authorize the states to levy taxes on interstate commerce according to some system which it itself provides?

We may say, *1st*, that the Constitution itself does not expressly forbid the states to tax interstate commerce but merely confides its regulation to Congress, *2nd*, recognizing that the power of Congress is exclusive and that the inaction of Congress is the expression of its will that there shall be no regulation, and therefore, no taxation of interstate commerce, we must admit at the same time that Congress may regulate it and thereby provide for its taxation by formulating a system which

is to go into effect in case of affirmative action by the states, and *3rd*, that if the Supreme Court reverses or seriously modifies the unit of value rule, which it has laid down, particularly in the *Express Company cases*, Congress may not only authorize the states in this way to tax interstate commerce, but also may prevent their imposing taxes on what is really interstate commerce in any other way than the one authorized.

If this is the law, the way is really open for a comparatively uniform method of state taxation of interstate commerce throughout the United States. It may perhaps be inexpedient for the states that such a plan be adopted. It may be that through the tax on the gross receipts of domestic corporations, where such receipts are derived only partially from interstate commerce and the tax on the property of all other corporations, assessed according to the unit of value rule, the states may be able to secure all the revenue they desired, and that such taxes satisfy the standards adopted by those expert in the economics of taxation. If that be the case, what has been said is naturally rather flat, stale and unprofitable. If, on the other hand, existing conditions are not satisfactory from the point of view of state revenue or from that of the commercial unity of the country or from the point of view of the economics of taxation, it behooves those interested in securing a scientific adjustment of these rather complex relations to bestir themselves and secure from Congress an act which will secure the desired result.

It has been the purpose of this paper, however imperfectly fulfilled, to point the way in which this may be done and to state the reasons for the belief that this way is not contrary to the provisions of the United States Constitution.

STATE TAXATION OF INTERSTATE COMMERCE—DISCUSSION[1]

FREDERICK NEWTON JUDSON: In the discussion of this subject we should carefully distinguish between the taxation of interstate commerce and the taxation of the property employed in that commerce. This distinction is perhaps more important in the legal and constitutional, than in the economic and practical, sense; but it has been repeatedly declared by our Supreme Court as necessarily involved in the exercise of this sovereign power of taxation under our dual form of government. Thus the states cannot tax interstate commerce as such, that is, they cannot tax the privilege of carrying on interstate commerce, they cannot exact licenses from interstate railroad or telegraph or telephone companies, nor from traveling salesmen, nor can they tax property actually in commercial transit.

But the state's right to tax all property, tangible and intangible, which is located within its jurisdiction is inherent in its sovereignty, and it is difficult to see how this right which is thus inherent in a sovereign state can be abridged or limited by Congress under our present constitutional limitations of federal authority. The so-called unit and mileage rules, discussed in the *Express cases* and elsewhere, are in a legal sense simply methods held admissable for determining the actual value of inter-

[1] It has been impossible to secure the full text of Professor W. M. Daniels' discussion of Professor Goodnow's paper. He (1) controverted the proposition that state taxation of interstate commerce under the unit of value rule endangers interstate commerce; (2) denied that the withdrawal from the states of the revenue now obtained by that method of taxation would cripple them financially; and (3) contended for a uniform federal tax on interstate commerce chiefly for purposes of regulation rather than for revenue.

state property located within the state's jurisdiction. The enforcement of this right of the state to tax the property employed in interstate commerce in a practical sense may involve the taxation of interstate commerce. Thus the taxation of the property of a telegraph company according to its mileage of poles in the state is practically a tax upon the company and a charge upon its revenues, as much as a license upon its right to conduct an office for interstate business. But the distinction exists in a legal sense, though it may not in a practical sense. The states cannot tax the privilege, but they can tax the property employed in the exercise of the privilege.

The authority of Congress as suggested in the interesting and thoughtful paper of Professor Goodnow would seem to be limited to the regulation of the taxation by the states of interstate commerce. Assuming, as suggested by Professor Goodnow, that Congress in regulating interstate commerce could lay down a rule for taxing that commerce by the states, would not its effect be to increase the taxing power of the states, because it would give them, under such a regulation, the power of taxing where now they cannot tax at all, while their power to tax property located in their jurisdiction, including that employed in interstate commerce, would remain the same as before? In other words, the change proposed, as it seems to me, would only be effectual in extending the taxing power of the states under this national authority to the privilege of taxing the privilege of carrying on interstate commerce, which is now denied to the states. Thus taking a concrete illustration. The states now cannot exact licenses, as from a telegraph company, for the privilege of carrying on interstate commerce. Congress might extend to them this

right under national regulation, but it could not control them in the right which they now have as sovereign states to tax the property of the telegraph company located within the state.

I do not agree, as suggested in the paper that under the application of the state's authority to tax the property employed in commerce under the unit and mileage rules for ascertaining the valuation of that property, that no federal authority can intervene to protect interstate commerce. The federal authority can always be invoked to prevent the states from taxing interstate commerce under the guise of taxing property employed in the commerce. The line may oftentimes be difficult to draw, but it exists none the less. Furthermore, under the fourteenth amendment the states can only tax such property according to the valuation, and at the rate that other property of the same class in the state is taxed. This federal power to restrain the possible abuse in the exercise of the state's sovereign power of taxation, guaranteeing the equal protection of the laws, is really the "sleeping giant" of the Constitution.

As the practical effect of the proposed change would be the extension of the taxing power of the state over interstate commerce, and not in the regulation of any existing power, I doubt very much whether such an end is desirable. It would seem that the states now have all the taxing power in relation to interstate commerce which they ought to have in view of their power to tax the property, tangible and intangible, which is located in their jurisdiction employed in that commerce. Is it not better that interstate commerce, that is the privilege of carrying on such commerce, should remain free from state taxation, rather than that it should be taxed by states under the regulation of Congress, as any in-

creased power of state taxation would be an additional burden upon such commerce?

The scientific adjustment of the complex problems involved in the exercise of this sovereign power by dual sovereignities in the same territory is no doubt desirable, but I fear that it cannot be secured by the remedy proposed. The most serious practical difficulty, which the federal power cannot control, is in the duplicate taxation which grows out of the subjection of the same property to the taxing power of two jurisdictions, and this can only be remedied by interstate comity based upon a supporting public opinion. But this is a question of moral and political honesty, rather than of economics.

Carl C. Plehn: I hesitate to criticise Professor Goodnow's paper for two reasons. The first is the respect which I entertain for his well tested knowledge of American constitutional law, which would lead me to fear pitting my opinion against his on a disputed point on that subject. I may be permitted to say, however, that so far as my comparatively limited investigation has gone, I am of the opinion that the view he has presented is correct. If Congress should prescribe the methods by which alone the states might tax corporations engaged in interstate commerce, the Supreme Court would probably refuse sanction to any other method. Such a conclusion seems unavoidable from the past decisions with reference to the taxation of national banks.

The second reason why I hesitate to criticise the paper is that it falls distinctly in the line of my hopes, and, I trust, in line with those of all who are sincerely working for the reform of our American system of state taxation. It offers a feasible solution of the vexed prob-

lems of uniformity in taxation, so far as corporations are concerned, whether the corporations be interstate or other. Economists have long defended the right of prescription as of the highest utility because of the certainty which it infuses into economic dealings. The most universally accepted, practically uncriticised, canon of taxation is that of *certainty*. If it be true that certainty as to just treatment, is valuable to corporate wealth, as it is to public welfare, then any method which promises this treatment is to be hailed with joy. This assumes that Congress will be more likely to deal justly, broadly and liberally with corporations doing an interstate business than would the state legislatures. That this is the case, I think, needs no argument.

In Professor Seligman's testimony before the Industrial Commission, he suggested that Congress should authorize the federal government to collect the taxes from interstate corporations and apportion them among the states. This obviously encounters a multitude of constitutional and political difficulties. But Professor Goodnow's paper suggests that all, and more, that Professor Seligman hoped to accomplish can be attained by a simpler method. All the states are seeking to remedy some of the most glaring faults of the general property tax, and most generally by supplementing it by corporation taxes. To suggest a method by which they may all be whipped into line and do the same thing and the just thing is a noble service and I congratulate Professor Goodnow on being so fortunate as to make that suggestion.

TRUSTS

HENRY C. ADAMS

A trust may be defined as an industry which, on account of its size or of its form of organization, exercises a dominating influence on the production or the sale of the goods in which it deals. This definition renders two important services. It draws a clear line between a great industry and a trust organization of a great industry, and it provides a test for determining what industries have attained the trust organization.

Four lines of argument may be found in current discussion designed to reconcile us with the existence of exclusive industries. The first is that trusts are the result of natural law and are a healthful industrial evolution; the second is that the economic law of competition persists, no matter what the form of industrial organization; the third is that trusts are productive and should receive our approval for the same reason that we grant approval to a labor-saving machine; and the fourth is that common law principles already provide adequate remedy for any conceivable abuse of the liberty of contract. Let us give a moment's consideration to each of these lines of argument.

I. TRUSTS ARE THE RESULT OF NATURAL LAW

The organization of competing corporations into a single all-embracing business enterprise is regarded by the first class of trust apologists as a normal step in industrial evolution. Upon this point Professor Gunton expresses himself as follows: "One of the marked features of the economic development of the century is the radical change that has taken place in the character

of competing units. Under the primitive hand labor method the competing unit was the individual. With the development of factory methods the individual, as a competing unit, was superseded by partnerships, because they could more economically employ the new methods. With the growth of invention, partnerships were superseded by corporations. With the growing completeness of machinery and magnitude of business, corporations grew larger and larger, until the corporation is now the prevailing form in the most advanced countries. . . . . In short, the progress during the nineteenth century has irrevocably established the group as the competing unit; the union as the unit on the labor side, the corporation[1] as the unit on the capital side." The trust is characterized by Professor Gunton as the successful experiment of many recent experiments in the evolution of the industrial unit.

So far as history is concerned nothing can be said in criticism of the above statement, except that it tells but half a truth. It overlooks the essential point that with every step in the modification of the business unit it has been found necessary to prescribe new legal conditions for the direction and control of industry. Every close student of political economy knows that the doctrine of competition, as foreshadowed by Locke, and Hume, and as expressed by Adam Smith, was formulated for a society which rested on tools, and that the introduction of the factory system necessitated a modification in the statement of the laws of competition and

[1] I am obliged to assume that by this phrase "the corporation" Professor Gunton means the trust corporation which results from the organization of previously competing corporations into the gigantic corporation. He cannot mean simply the corporation as a form of industrial organization, inasmuch as such an interpretation would limit his historical reference to the middle of the nineteenth century.

of the statutory conditions under which factories were permitted to operate. He is also familiar with the further fact that the appearance of the private corporation about 1840, which by 1870 had become a prevalent type of industrial organization, necessitated a second reorganization of the law of competition, and was the direct occasion of enactments designed to guard the public from threatened evils. The natural conclusion from this appeal to history, when the full story is told, is not that trusts are a sacred product of natural evolution, superior to statutory control, but rather because they are a new form of industrial organization, that they should be met by a new expression of the law of competition and by a new statement of statutory rights and duties. He is a superficial thinker who sees in this appeal to history a reason why trusts should be permitted an uncontrolled development. In any comprehensive view of society the institution of the state, which rests on coercion, is as natural as the institution of commerce which rests on voluntary association, and as such has an equal right in logic to claim whatever presumption lies in the theory of evolution or in the doctrine of natural law.

II. IS TRUST COMPETITION EFFECTIVE COMPETITION?

We come now to a consideration of those publicists who assert that competition persists as a controlling force in industry notwithstanding the consolidation of competing companies into a single organization. "Competition," says one of our leading sociologists, "disappears in one form only to reappear in another." This is an eminently sane and just observation and one that no economist would care to deny. It is incumbent upon us, therefore, to inquire what the new form of competi-

tion is by which this new manifestation of industrial power is to be controlled, and to ask if it is competent for the task of control.

This class of ideas presents itself under two forms, namely, the claim that competition exists between commodities offered for sale, and the claim (or possibly merely the implication) that we may safely rely upon the substitution of potential competition for active competition.

The logic of that apology for trusts which rests upon the claim that competition of goods will persist notwithstanding the trust organization of industry, may be suggested by the following concrete illustration. If the manufacture of shoes be monopolized, and the monopolist charge too high a price for shoes, while the manufacturer of bonnets, with a keener insight into the psychology of the purchaser, places the price of bonnets on a relatively lower plane, the ladies of the country will choose to go barefoot and spend more in bonnets. This will curtail the sales of the shoe monopolist, and he will, as a result, reduce the price of shoes. Possibly Professor Giddings' statement of the argument may be preferred. He says: "When one group of producers demands unusually high prices, all other groups of producers can very considerably increase their sales in virtue of that law of human nature according to which men can and do, to a great extent, substitute one group of conveniences and pleasures for another, postpone certain enjoyments for the time, and distribute their expenditures at all times in such a way as to obtain the greatest satisfaction for a given outlay."

This expression of the competitive principle is universally conceded, but before one accepts it as a satis-

factory apology for trusts, there are two observations to which attention should be called.

In the first place, it should be observed that the full limit of the influence of competition among monopolists for their respective shares of the people's income, is to guard the consumer against flagrant abuse of monopolistic power, and this, I submit, is a poor substitute for that phase of competition by which the public is guaranteed that the price of goods will not exceed their cost. The restraining influence of the fact that if prices are too high sales will be curtailed, is a familiar line of reasoning, but Professor Giddings is the first writer, so far as I am aware, to imply that this phase of competition would grant the same protection as would be granted by free competition between independent producers. The latter phase of competition is a guarantee that the market price will not permanently stand above the cost of the goods; the former is merely a guarantee that the market price of goods produced by monopolists will not be so high as to defeat profitable sale.

My second observation is, should this phase of competition prove to be a real check upon the profits of centralized industries, the same considerations which lead to the consolidation of independent producers in the same line would lead to a consolidation of monopolistic competitors in all lines. But this is so bizarre an idea that I will not claim your time for its discussion.

What now shall we say of the suggestion that, active competition having been suppressed, the public may still place reliance upon potential competition as a guarantee of fair treatment on the part of monopolists? This I understand to be the position held by Professor Clark. By the side of this consideration there should be placed also the suggestion of Professor Jenks that ex-

perience on the part of trust managers will induce them to become more and more conservative in the use they make of their monopolistic power. He, too, like Professor Clark, relies upon the claim that the abuse of power invites competition.

I have no desire to deny that potential competition exists, nor that it is capable of exerting a certain degree of influence upon the manner in which a monopoly is administered. That, however, is not the question. The point at issue is whether the public is justified in placing sole reliance upon potential competition, active competition having disappeared with the disappearance of the actively independent producer.

I confess it seems to me that the statement of such a proposition carries with it its own refutation. The establishment of a new commercial enterprise is by no means an easy task. In the first place, considerable time must elapse between the beginning of an investment and the completion of the plant, and the capital invested must either forfeit its earnings during this period, or more capital must be borrowed and charged to cost, with which to pay dividends on outstanding stock. In the second place, the investor must take into consideration the necessary loss incident to mistakes due to inexperience. A successful manager cannot be found every day and we may be sure that the best talent is in the service of industries already organized. In the third place, the building of a factory is not the building of a business, the most difficult part of establishing a new industry consists in securing an assured market. And finally, the power of the trust over the avenues of sale are so secure, that free capital and free labor will hesitate a long time before venturing to enter into active competition. All this means a very considerable margin

of excessive profit before latent competition can be brought into play.

This class of facts is as well known to the management of the trust as to those who are seeking investment for free capital. Is it not evident, therefore, that the administrators of a trust will calculate upon this barrier against the inroad of competition and adjust prices accordingly? The interests of a trust are not placed in the hands of fools or of cowards, and, in view of the many difficulties incident to the establishment of new industries, are we not justified in saying that potential competition can not go farther than to obviate the most flagrant abuse of power. The American people have been taught that the fair price is the cost price. For a century they have proceeded upon the assumption that active competition is necessary to guarantee this fair price, and, in view of the manifest inequalities in the strategic position occupied by a monopoly already established, and by a competing concern to be established, it is doubtful if any amount of argument can induce them to rest satisfied with potential competition.

III. ARE TRUSTS PRODUCTIVE?

There is another class of writers who rest their apology for trusts upon the claim that organization is a productive principle and that trusts, which represent the application of this principle to manufactures, are bona fide producers. This means that the consolidation of competing industries is a step in industrial betterment the same in kind, and to be followed by the same advantages, as the substitution ot machinery for tools, or the introduction of any method or process by which, for a given amount of labor, a relatively larger amount of wealth

may be produced. We can not accept the fact that men have found it advantageous to consolidate competing industries as proof that such consolidations are productive, for such a conclusion overlooks the distinction between product and profit. It is conceivable that a highly centralized industry may increase profit to the corporation while contributing nothing to the product of the nation; and it may be that a desire to obtain the former rather than to promote the latter lies back of trust organization. It is consequently, pertinent to inquire whether or not the trust is truly productive.

There is nothing mysterious about the process of production. It consists in the application of labor to the making of useful goods or the rendering of useful service. It includes agriculture, the object of which is to secure possession of raw material; it includes manufacture, which consists in fashioning material to meet the needs of consumption; it includes commerce, which consists in the transportation of material and product to the consumer. Modern refinements of economic theory respecting value have not seriously modified this fundamental structural description of what constitutes industry. If, now, it be true that the amalgamation of independent competitors constitutes a productive process, that productivity must show itself in one of the three lines of activity described. Under no other assumption is it reasonable to say that the trust organization is productive in the sense that the invention of a labor saving machine is productive.

So far as that phase of commerce which has to do with transportation is concerned, it is admitted that the size of plant and density of traffic are a rough measure of productive ability. Can the same be said of the pro-

cess of manufacture? Is it like railways, subject to the law of increasing returns? Consider what is implied in such a concession. If this be true there is no assignable limit to the profitable size of a manufacturing plant. If this be true, the principle of monopoly inheres in the manufacturing industry. If this be true there is the same reason why government should interfere in the manufacturing industry as there is why government should undertake the control of railways. While admitting that these considerations open up a field of economic theory as yet but partially explored, I confess I am unable to grant such conclusions. To me, it seems clear that the process of manufacture is subject to the law of constant returns and that, on this account, the thought of monopoly is foreign to its nature. Both analysis and experience make evident the fact that beyond a certain point, increase in the size of a manufacturing plant does not contribute to economy. The growth of the typical industry during the past century and a half should cast no doubt upon this conclusion, for this growth, so far as it inheres in the nature of the manufacturing processes, is primarily the result of new inventions and of new applications of the principle of division of labor. If, now, the only normal motive for increasing the size of manufacturing industries be to make room for a new invention, it is evident that, at any particular time in the development of commercial arts, there is for every branch of manufacture a size which enables the full realization of the principle of division of labor. This may be termed the size of maximum productivity, and provided a manufacturer has sufficient capital to enable him to own a plant of this maximum size, he can easily hold his own in the world of competition. Indeed, an increase in size beyond this point,

unless it be a complete duplication of the plant, will result in a decrease of efficiency, for it introduces confusion into what before was a perfected application of the principle of division of labor.

The converse of this is also true. If a manufacturer fails to increase his capital to the size required for the most effective use of machinery, he will be forced to the wall, a fact which suggests the observation that, not only are trusts in themselves unproductive, but they will, if they gain control of the industrial field, tend to check development in the technique of industry. It does not lie within the purely commercial motive to force a monopolist to adopt the latest and most effective mechanical devices. On the contrary, the monopolist waits upon the wear of old machinery before adopting improved methods. If you ask what is the fundamental explanation of the tendency towards the consolidation of manufacturing plants, I reply, it is the desire on the part of the proprietors of inferior plants to shield their capital from the competition of more perfect methods of production. The man with a poor plant sets the ball rolling by offering goods at cut-throat prices, for he has little to lose and much, possibly, to gain; the man with the best plant, seeing the advantage due him from his enterprise threatened by this predatory competition, tries first to club his free booter rival into submission, and if he fails in this, takes him into partnership. This is the way in which trusts grow. The initial motive is to secure an income from poor capital. The final result of organizing industry in response to this motive will be to check enterprise. Just at present, while the process of consolidation is going on, and while the vision of a world's market is before the American manufacturer, it may be

that trusts tend to render general the best methods of production; but the end is not yet. Monopoly is now what it always has been. The only means of perpetuating itself is by stifling energy and limiting progress. In response then, to the inquiry respecting the productivity of trusts, there seems but one answer. Confining the question to the process of manufacturing, not only does the amalgamation of independent producers into a single industrial organization contribute nothing to the cheapness of the process of manufacture, but allowed its normal development it will, to speak mildly, tend to dampen the ardor for improvement, and thus bring us to the beginning of the end of the "industrial revolution."

It may be urged that I overlook the savings incident to great organizations. No, I do not overlook the possibility of savings. Savings incident to great industries are of two kinds: first, the production of by-products in sufficient quantities to make their collection and preparation for the market profitable, and second, the avoidance of unnecessary expense in the administration of the business and in the sale of the product.

So far as by-products are concerned, provision has already been made for them in the statement that the normal size of a productive industry tends to increase with every improved appliance or perfected process. The discovery of a new by-product may necessitate an increase in the size of the plant, but the increase thus necessitated, is limited to the size required for collecting these products in profitable amounts. In order, therefore, to introduce the saving of by-products into an argument for the support of an organization of the country's industries in which each product is represented by a single producer, it would be necessary to

show that nothing less than 75,000,000 of consumers would furnish a market sufficiently extended to warrant an industry of the size required by maximum efficiency. Such an assumption is absurd, and doubly absurd when to the home market of 75,000,000 of consumers we add the world's market. Large industries may be necessary to enable the savings of by-products, but not a trust of large industries.

With regard to savings in administration through consolidation, I confess I am somewhat skeptical. It is true that the number of presidents may be decreased, but what shall we say of the salaries of those that remain? It is true that expenditure for advertising may be reduced and the payroll of travelling salesmen curtailed; but we are entirely in the dark as to the extent of this saving. In the absence of information we are obliged to go back to analysis and to rely on fundamental principles. If the manufacturing industry can be organized like an army, if the decision of the management in one case may be generalized into a universal order, if, in short, the process of making and selling goods is a process *en gross*, like transportation, and not a process that commands at every step the personal attention of trained intelligence, then we might talk of savings in administration incident to consolidation. But such is not the character of the manufacturing industry. The nature of the manufacturing process does not permit of such savings at least to the extent that it becomes a controlling consideration in the organization of the business. Moreover, these arguments do not fit well together. Laborers, we are told, are to get more for their work, investors are to get more on their capital, and, so far as we can learn, the salary list of officers is not greatly decreased. Where, then, in view of the fact

that the inevitable tendency of monopoly is to stifle invention, is there any saving that the public is able to see. There remains only advertising and travelling men, a mere bagatelle, if exception be made for patent medicines, as compared with the average of expenditures incident to great enterprises; and I submit that the abandonment of active competition which is the only guarantee the public has for continued development in the technique of industry and for fair treatment upon the market, is a high price to pay for the destruction of ten cent magazines and the suppression of the travelling fraternity.

If trusts are not productive, are they profitable? Yes, trusts are profitable. They are profitable to their promotors and to those who by means of them are able to convert the common stock of a sinking concern into the preferred stock of a consolidation, provided the consolidation enjoys a monopoly of the market. The promotor makes money by over capitalization. For him the organization of a trust is merely a new phase of the old stunt of crystallizing a temporary advantage into a vested interest and then selling it out to innocent holders. But I cannot follow farther this line of analysis.

POSSIBLE SOLUTIONS

This paper would be incomplete as an introduction to general discussion should it contain no reference to the solution of the trust problem. As indicating the general point of view, it may be remarked that it is a mistake in strategy, if not, indeed, in logic, to treat the trust as though it were an industrial institution like the corporation or the trades-union. The trust is rather a phase of corporate activity called into prominence by a

combination of causes. It is, therefore, possible to destroy what we call the trust without impairing the efficiency of capital or the productivity of labor. A satisfactory programme of reform must touch the underlying causes of this present phase of industrial consolidation. I cannot, of course, speak of all these causes, but venture to mention three, each of which should have a place in any programme for the correction of prevalent abuses.

First. A survey of the past hundred years of industrial change makes evident the fact that industry on its mechanical side has developed more rapidly than on the side of management and administration, and in any final explanation of congested competition, a phrase which appears to me to suggest a fairly accurate diagnosis of the industrial ills of our time, the scarcity of business talent holds an important place. I do not regard this as a fundamental explanation of trusts, but as a contributary condition of deep significance. In so far as the centralization of industrial power is traceable to failure in the supply of business ability, no permanent relief from the evils of trusts may be expected until the highest grade of business intelligence becomes the common possession of the business world. The trust may be regarded as a corner in business insight, business talent and business courage. Many agencies must coöperate to break this corner, but among these agencies none should be assigned a more important rôle than the universities and colleges of our land. When high grade commercial education comes to be acknowledged as a legitimate and dignified phase of university instruction, and made attractive for young men ambitious for business success, the first step will have been taken toward the restoration of those conditions in which healthful competition

can again control industry. From the point of view of our universities the solution of the trust problem means the development of courses in higher commercial education.

Second. A study of the market since the introduction of steam transportation makes clear the fact that the temporary collapse of the competitive principle pertains to the transportation and sale rather than to the manufacture of goods. How far the recognition of this fact might lead the government in the regulation of the market, no one can say; but one point is clear. That which gives character to the modern market is the rule according to which payment is made for the service of transportation. This means that the railway problem lies at the bottom of the trust problem. In making this statement, however, I am unwilling to concede that the solution of the railway problem is limited to the guarantee of equal facilities to all shippers at the same price. The heart of the problem lies deeper. If the mischievous features of trusts are to be dissipated through the agency of railway reform, that reform cannot be arrested until the principles of public utility, rather than cost of service, becomes the ruling consideration in the formation of freight and passenger schedules. Before an audience of economists it is not necessary to develop such a suggestion, but I may, perhaps, indicate the extent to which my mind has been forced along this line of reasoning by the remark, that the railway problem will not have been solved until the manufacture and the sale of goods is again brought under the control of normal and healthful competition. Should this require the nationalization of railway property I find myself constrained to admit that the dangers incident to such

a policy are of relatively less significance than the dangers with which our industrial organization is threatened by the perpetuation and further development of manufacturing and commercial monopolies.

From the point of view of government then, the solution of the trust problem demands before all else, an efficient governmental control of the business of transportation, to the end that all manufacturers may be treated alike in the markets of the nation. The truth is that the monopolistic features of trusts pertain to the buying of material and to the selling of goods. It is market conditions and not manufacturing conditions that should claim the attention of the reformer.

Third. Neither the paucity of business talent nor the mal-adjustment of railway schedules is adequate to fully explain the tendency toward monopoly among manufacturers. Mention must be made of a third cause equally potent and infinitely more difficult of adjustment. I refer to labor organizations. The question as to whether trades-unions can or cannot raise wages is a familiar one to economists, but one feature involved in this controversy seems to have been overlooked. He who follows the logical development of the concession made by John Stuart Mill,—namely : that organization among workmen can increase the price of the commodity which they sell,—will be brought, sooner or later, to the conviction that every step in the rise of wages, traceable to the demand of workmen for higher pay, results in the disappearance of those employers who, under the old rate of pay were just able to maintain a profitable existence. Expressed in a sentence, this means that every successful strike sets in motion those forces which result in the concentration of industry. Trades-unions may raise wages, but they do so at the

expense of the small employer. If this be true, it is evident that the solution of the trust problem, or perhaps it would be better to say the readjustment of industrial forces and conditions by which the principle of commercial competition will be placed again in the seat of control, can not be attained without a final determination of the relative rights and duties of employers and employes, and the evolution of an organization, partly political, partly industrial, by which these rights and duties may be expressed, and through which they may be realized.

From the point of view of the economist therefore the solution of the trust problem means a more perfect analysis of industrial conditions and a more perfect understanding of the moral rights and obligations of labor. Of one fact we may rest assured. If the industrial analysis be clear, and the moral rights be plain, those who make our laws and administer our courts will not be backward in giving to these rights an efficient expression.

TRUSTS—DISCUSSION

BALTHASER H. MEYER: In 1886, the writer of the paper under discussion contributed an article to the economic discussions published in *Science*, in which he, Professor Ely and others participated, which outlined the essential features of the philosophy underlying the present paper on Trusts. In that article Professor Adams treated of three co-ordinate fundamental factors; namely, the nature of men, physical forces, and the legal structure of society. It was there stated that the legal structure of society had not kept pace with economic development, and that in this lack of adjustment lay our economic problems. Later, as president of the Economic Association, Professor Adams repeated this thesis, in substance at least; and to-day we find it re-stated in this paper on Trusts. We may assume therefore that this thesis expresses one of Professor Adams' fundamental principles of economic philosophy. With this philosophy, as I understand it, I am in hearty accord. Trusts are spoken of not as a sacred product of natural evolution, but as a new form of industrial organization which should be met by a new expression of the law of competition and by a new statement of statutory rights and duties. I desire to direct my remarks almost exclusively to this sentence in Professor Adams' paper.

Twenty-five and fifty years ago it was customary to charter corporations for specific purposes. Statutes frequently prohibited corporations from entering upon other lines of activity than those for which they were specifically organized. Thus, laws prohibited banking companies from doing an insurance business,

railway companies from doing a banking business, etc. An analysis of the great trust charters of to-day shows that these corporations have received omnibus powers, varying in number from a half dozen to several dozen distinct enumerations, embracing a great series of operations and processes from the raw material to the finished product, and generally ending with the blanket provision that the enumeration of powers contained in the charter shall not restrict the corporation to the same. In a word, the charters of many of the great trusts might as well be condensed into the simple statement that the persons named therein are authorized to do any and all things which it is possible to do legally. Such charters may be necessary, and beneficial even, but there is nothing in our legal structure which is capable of meeting the emergencies which may arise under such charters. I hold in my hand one of the latest of this type of charters. One of the objects for which this corporation is organized is expressed in a long succession of legal phrases the sum and substance of which is that the company may engage in anything and everything under the sun, it may acquire, hold, sell all kinds of property and issue valuable paper in payment thereof. It is expressly provided that members of the board of directors may make contracts with the corporation, within certain nominal limitations, which in substance are exactly like the contracts entered into by certain men connected with the United States post office and for the investigation of which the grand jury is now in session. Another section provides that the board of directors shall determine whether and to what extent and at what times and places and under what conditions and regulations the accounts and books of the company shall be open to the inspection of stockholders. A pro-

vision of this kind appears to be prudent and necessary in order to prevent the abuse of the privilege of inspecting books. It is conceivable that a person may acquire a little stock in a great corporation with the view of gaining access to books from which he may, perhaps, garble certain facts which can be used to the injury of a sound business, and for purposes of blackmail. However, there exist no adequate provisions in this charter, nor in the general corporation laws of the state in which it was granted, which insure to stockholders their legitimate rights in gaining information concerning the business in which they have invested their money, if a recalcitrant and hostile board of directors chooses to be arbitrary or unjust. [Professor Meyer read extracts from the charter illustrating these various points.]

Another illustration of the manner in which our industrial organization has run ahead of the legal structure is found in what may be called transverse business of affiliation, or, in the railway world, community of interest. Community of interest more properly designates an affiliation on the part of a single series of business enterprises, like railways, the manufacture and sale of steel, oil, etc., each of which is naturally and logically connected in a consequential manner with every other member of the series. In ordinary manufacturing enterprises this form of association follows the lines of production from the raw material to the finished product and its consumption. The other or transverse type of association follows the points of contact among a number of enterprises in their business sequences.

The mining company for instance, has necessary and close relations with manufacturers of machinery, with railways, banks, etc. This type of association, although as old as the other is of relatively recent growth on a

large scale, and at present it appears to be the predominating principle in the industrial world, as the following table will demonstrate.

A table illustrating transverse business affiliations, based upon the "Directory of directors for New York," 1902. The classification of business enterprises adopted in the table makes a somewhat arbitrary assignment of certain companies unavoidable. The table does not take cognizance of stockholdings as such. It merely represents the number and kind of companies in which which certain men act as directors or officials.

NAME.	Bank.	Trust.	Insurance.	Safe Deposit & Guarantee.	Railway.	Telegraph.	Telephone.	Cable.	Express.	Steamship.	Real Estate.	Manufactures.	Unclassified.	Total.
Alexander, J. W.	3	2	1	1									1	8
Babcock, S. D.	2	4	3		3		1			1	6		1	21
Baker, Geo. F.	6	7	3	2	8						1	9		36
Belmont, August	6	5	3	1	10						1	7	2	35
Cannan, H. W.	1	2	1	2	7					1		1	2	17
Cox, C. F.	1			1	26								1	29
Depew, C. M.	1	4	1	3	53	1						2	2	67
Fish, Stuyvesant	3	1	2	1	3	1							2	13
Gary, E. H.	2				6					1	1	23	1	34
Gould, Geo. J.	1	1	1	2	23	8	2	1		1			2	42
Harriman, E. H.	3	2	1	1	25	1			1	3				37
Hyde, J. H.	5	4	5	4	6	1						2		27
Lamont, D. S.	1	2	1		21				1	2	1	1		30
Morgan, J. P.	1		2		22	2		1			1	2	2	33
Rockefeller, William	6	1	1		9							11		28
Rossiter, E. V.	2		1	2	31							3		39
Sage, Russell	2			1	11	6	1	1		1	1	2		26
Schwab, C. M.		1			5							22		28
Stillman, J.	10	6	6	2	12	1					1	6	4	48
Twombly H. McK.	1	2	1		28						2	1		35
Vanderbilt, W. K.	1				50								3	54

The names in this list have been selected quite at random and the table could be extended through hundreds of names. A legal structure of society which was framed for a business world, simple in its organization, can obviously not suffice for an extremely complex system like that revealed in this table.

Professor Adams' reference to railways is so broad that the whole subject of transportation could be discussed under it. I shall confine myself to the statement of a few facts the contemplation of which urges upon

us the necessity of a new statement of the law of competition in its application to the railway business.

Every member of this association knows how fifty years ago the railway net of the United States was composed of small independent lines, frequently in competition with one another. As the systems grew agreements of various kinds were resorted to, beginning with rate agreements, continuing through pools, 1870 to 1887, transformed into traffic associations, 1887 to 1897 and 1898, and culminating in the community of interest principle, of which the Northern Securities Company is the most conspicuous example. The Northern Securities Company is the logical culmination of fifty years of railway development in the United States. Running chronologically parallel with this development we have fifty years of railway legislation based upon the fundamental but erroneous assumption that the railway business is like ordinary business and that competition among railways is like competition in private business. Laws which assume free and unrestricted competition among railways must fail because such competition does not, generally speaking, exist. Competition for traffic, in which the public has little or no interest, may prevail, but competition for the rate as a regulative principle has failed the world over. Anti-pooling laws and anti-trust laws have promoted that very type of railway organization which it was intended they should prevent. A body of railway administrative inventors has been in constant rivalry with a set of legislative inventors, and in this rivalry the railway set has always kept a little in advance of the legislative set. Legislation cannot overcome the inherent tendencies of the railway business. We may compel men, by law, to hang tomahawks on the walls of their houses, but no law can compel men to

use these weapons upon each others' skulls, especially when they are neighbors who must transact business with one another. Railway legislation has too often assumed that the cracking of skulls brings advantages to the public. I believe in granting to railways such powers as the nature of the business demands and remodeling our laws accordingly. I am unwilling to believe that the possession of large power will in itself lead to abusive use of such power, provided the state entrusts adequate discretionary powers to administrative authorities that can wield a strong hand over the lawbreaker.

James Edward Le Rossignol: The discussion of this paper, as Dr. Adams intimates, has suffered from much exaggeration, especially in regard to the economies incident to large industries, monopolistic or otherwise.

The condition of the independent producer is seldom altogether hopeless. His persistence in the face of extreme competition, is little short of remarkable. Even discrimination in railway rates does not always cause him to perish, and one is forced to the conclusion that the power of free competition is not so destructive as one has been led to believe.

The catchword "survival of the fittest" has been used as an argument to show that in every field the successive elimination of marginal producers must go on until one fit survivor alone is left. But if the development of industry is at all similar to the evolution of animals and plants, no such conclusion can be drawn. At times it seems as though the seed of a single plant would fill the earth, as though carnivorous beasts, birds and fishes would speedily exterminate all the rest, but, for one reason and another, land, air and sea are peopled

with innumerable forms of life, which continue to exist and to flourish in spite of, or with the help of the most adverse circumstances.

It may be that there is a similar law of balance in the industrial world. It may be that a perpetual struggle can go on without the elimination of other than the weaker competitors. If so, the trust is, as Professor Adams says, an ephemeral symptom of disorganized industry, created, it would seem, rather for the sake of the marginal producer than for the good of the strong competitor or the welfare of society at large. Indeed, the marginal producers, great and small, have received too much consideration, both in the sphere of economic thought and in that of political and industrial activity.

But what consolation is there in the thought that the trust, or monopolistic consolidation, is to pass away, if we are to have with us still the combination, pool, syndicate, community of interests or gentlemen's agreement with its familiar methods of dividing and limiting output, fighting outsiders and controlling prices? The consolation, though slight, is not to be altogether despised. In form, the combination is a mean between the extreme of monopoly and the extreme of destructive competition, and since, in the language of Aristotle, all virtue is in the mean between excess and defect, the combination, in form, at least must be a good thing.

Unfortunately, as a matter of fact, it inclines toward the vicious extreme of monopoly, and the stability which it gives to business is not sufficient to justify an undue departure from the golden mean. But if the tendency toward the extreme of monopoly could be sufficiently corrected, there could be little objection to

combination as such, on the part of the capitalist, the laborer, or the consuming public.

That such correctives exist, and that they operate to prevent the worst evils of monopolistic control, no one can reasonably deny. There is pressure from outsiders, competition actual, potential and imminent. There is pressure from insiders, whose expanding business demands reapportionment of output and readjustment of prices. There are the demands of organized labor, ever ready to claim a share of increasing profits. There is pressure from buyers, many of whom are members of strong combinations, while the final consumers, though not yet organized for their own protection, exert a considerable influence in the creation of public opinion, which the wise producer can by no means afford to ignore.

When we consider these and other natural remedies, and assume the enlightened producer to act with due consideration for them all, we are inclined to wonder whether the activity of combinations involves anything more than a reasonable antidote to unreasonable competition.

But the fact that combinations do at times exact monopoly prices and secure monopoly profits cannot thus be explained away. The influence of the ordinary correctives is not sufficient to prevent a considerable amount of extortion, and if relief is to come to the consumer from any quarter it must be from the state, which can, in a perfectly natural way, increase its activity as a factor in industrial evolution.

That the state will do this must be evident to anyone who considers the influence of economic conditions upon the development of law. In the arid west the requirements of irrigation have in a few years pro-

foundly modified the common law doctrines respecting the control of streams and the use of water. The doctrine of riparian rights, reasonable enough in England and the humid parts of the United States, has been found unreasonable in Colorado and other arid states, where the maximum of social utility is obtained by diverting water from streams in order to put it upon the land.

Many similar illustrations might be given to show that, although economic development may be so rapid as to go in advance of law, so that many unreasonable things are done and many offences committed for which there is no remedy, in a comparatively short time the law overtakes the line of progress and harmony between law and equity is again restored.

The problem, then, is not the trust problem alone, nor the railway problem, nor even the labor problem in the narrower sense of that word. It is rather the single yet multiform problem concerning the distribution of wealth. In its present form the problem is presented for solution, not by economists and philosophers, but by the representatives of various economic interests—combinations of manufacturers, wholesalers, retailers, laborers, railroads, insurance companies, bankers—all conscious of the evils connected with unregulated competition and all presenting remedies which they think adapted to their own special troubles.

The controversy appears to centre around the words *fair* and *reasonable* as applied to prices, profits, wages, rates, methods of business, and the interpretations given to these words are as various as the interests concerned. It is not an economic problem that is involved, except in so far as it originates in the economic facts of human life. Nor is it a problem that can be solved out of

hand at a single session of a meeting like this, nor by any economist in the seclusion of his study, though he should rack his brain for a thousand years. It is primarily an ethical and political problem to be gradually worked out by struggle and compromise between the various interests involved.

EDWARD W. BEMIS: I have such an admiration personally for my old instructor, the author of this excellent paper, that any criticisms that may be advanced will be offered in the most friendly spirit. It is, however, as I understand it, the object of such a discussion as this, to supplement, or point out in a paper, any weaknesses, if such may be found, rather than to point out its strong points.

The opening portion of the paper, showing that even if trusts are a natural evolution they need legislation adapted to them, as much as did the factory system and the corporation, and showing further that trust competition or potential competition is not all that is needed, and that trusts should not be considered as necessarily productive because successful, and that we do not have adequate remedies now, in common law, for the trust problem—all this, which constitutes the bulk in space of the paper, is admirable. My criticism will be confined to the definition of the trust, and to the three reforms or advance steps suggested in the paper.

Professor Adams defines a trust as "an industry which on account of its size or its form of organization, exercises a dominating influence on the production or sale of the goods in which it deals." My criticism relates to whether it is necessary to include the clause "on account of its size or its form of organization." It is doubtless true that the trust must have large size

relatively to other business organizations in the same line of industry in order to dominate them, but the question is whether it is the size which gives the domination, or whether we are to look for the causes of the size. There may be disagreement with regard to those causes in the present state of discussion. It may be well, therefore, to omit from the definition any statement implying a theory of the causes of the power of the trusts, but if any causes are given, it seems as if they should be more fundamental than the question of size or organization.

How would it then do to define the trust merely as "an industry which exercises a dominating influence on the production or the sale of the goods in which it deals?" I do not think that Professor Adams believes, as some do, that mere size or form of organization necessarily gives a dominating influence, unless there is associated with these factors other elements such as special privileges to be referred to later on. Unless then, the definition can include a reference to all the important factors of a problem, it is better to omit any reference to causes and secure the merit of brevity.

Professor Adams is of course right in saying that any satisfactory programme of reform must touch the underlying causes of industrial consolidation. He mentions three such. It is interesting to note that he altogether omits, and rightly so, any endorsement or other reference to the prevailing fad of publicity. Of course this cannot be because he is opposed to publicity. No one can object to all the light on any phase of the trust problem which the advocates of publicity are likely to secure,—but it is refreshing that this is not put forward as a fundamental remedy or line of advance. Publicity, so far as it can be made effective, will be chiefly instru-

mental in showing which of the so-called trusts are real trusts, and to what extent they are sound investments. If the trust problem consists in the protection of investors from putting their money into enterprises which could not fill their expectations in the line of profit, then publicity would be more important than it is. It would of course show that the Standard Oil stock is a safer investment than some others. It would be as ridiculous to suppose that we were solving the trust problem by helping investors to find out which trusts are the strongest, as it would be to attempt to solve the problem of municipal monopolies by putting forward as our chief thought the determination of what gas or street railway stocks it is safer for one to purchase, or whose prospectus is worthy of the most confidence. Yet this is about all that most of the present national administration and many others, even some economists, seem to have in mind when they talk about separating the good trusts from the bad ones. Publicity for investors is well enough, but what we are chiefly seeking is protection for the consuming public and for competitors and employees. The kind of publicity that will bring that about is not the kind that is primarily in the minds of most advocates of the term. We will now take up the three suggestions of Professor Adams.

His first suggestion, with respect to the need of increasing the amount of business talent in the community, he himself concedes is not a fundamental matter, and to my own mind it does not seem even as important as to him, so far as it relates directly to the problem of the trusts, although its general importance and the value of commercial education as a branch of university instruction, and as one means of increasing

business talent, none of us who have ever been teachers would be inclined to deny.

Passing for a moment his second suggestion, we may note that his third and last is the need of "a final determination of the relative rights and duties of employers and employees." He appears to hold that there is something in the modern trade union movement which is a fundamental cause of the trust and must be changed. I do not understand what was in the author's mind, from his very brief references, sufficiently to reply to it. There is certainly much in the modern labor movement which can be criticised, although on the whole it appears a necessary weapon of labor and a benefit to society. It may be also true that organization of labor tends to promote combination of capital, just as the reverse is also true, but how the trust, in the sense of a giant corporation, independent to an alarming extent of either actual or potential competition, can be considered as a general thing to be an outgrowth of labor organization or of the modern labor movement, it is hard for me to understand.

The second suggestion, that of railroad reform, goes to the root of a great portion of the trust question. Until we can abolish all favoritism to large shippers, we cannot hope to make much progress with the trust question. If the advocates of publicity would say about half as much on that subject as they do, and one hundred times as much on the abolition of all railroad discriminations, we might hope in time to get somewhere with the problem before us. Despite some improvements, which the Elkins law has effected, the Interstate Commerce Commission in the synopsis of its seventh annual report transmitted to Congress December 18th, is obliged to state that even where tariff rates

are observed, it is possible to so adjust these published rates as to be equivalent to the payment of a rebate.

The new law "greatly aids the observance of tariff charges, but affords no remedy for those who are injured by such charges, either when they are excessive or when they are inequitably adjusted." It is a well known fact that one reason for the payment of the enormous amount of money in bonds to a certain "philanthropist" for his interest in enormous iron and steel plants, was because of his threat to parallel the main line of the Pennsylvania Railroad if he could not secure a continuance of the rebates which were responsible for many millions of his fortune.

Professor Adams omits one line of attack upon the dangerous powers of the trusts almost as important as their control of railroad rates, viz: their control of limited sources of supply of coal and ore, their control of patents, their protection from world competition by the tariff, and their escape from such a ratio of taxation to the market value of their property as is borne by the farmer and the small business man.

There is a tendency in much trust discussion to put the "cart before the horse" and to speak of the trust as producing a monopoly, whereas, in most cases it is the monopoly which produces the trust. There may be, and I am inclined to think there is something of a monopoly feature in mere aggregation of capital where an enormous amount of wealth is needed to secure the requisite machinery to open up markets in competition with an established corporation, but the importance of this monopoly is of minor consideration at present compared with the special privileges just referred to. Only those trusts have an assured future that have their "feet upon the ground" as Louis S. Post has lately put it in

the "Ethics of democracy," or those which are especially favored by tariffs, patents and unfair escape from taxation.

In the answer to the suit brought by Hodge, Curtiss & Smith, to prevent the United States Steel Corporation from carrying out its bond conversion plan, certain very significant statements were made. The answer was filed July 15, at Newark, N. J., before Vice-chancellor Emory. It placed the value of its iron ore properties at $700,000,000, and its coal and coke field and natural gas fields at $120,000,000, or over one-half of the entire $1,400,000,000 value placed upon the entire property. Its cash and cash assets, its plants, mills, fixtures, machinery, equipment, tools and real estate, its blast furnaces, and even its 1467 miles of railroads, amounted only to $576,000,000. Probably less than $500,000,000 represented actual material aud equipment.

In his testimony before the Industrial Commission, Mr. Schwab declared that his corporation owned 500,000,000 tons of iron ore in the North-west, which ought to yield a profit of $2.00 to $2.50 a ton, and about 60,000 acres of Connellsville coal, which he said was practically all there was, and which he said doubtless with considerable exaggeration, could not be bought for $60,000 per acre.

It would be very interesting if some university, or the Carnegie Institution at Washington, would provide for a thorough investigation of the assessments and taxes of the whole or any large part of the anthracite coal fields and the iron ore districts of Lake Superior, or the coke fields of western Pennsylvania, and compare these assessments with the valuations put upon those properties by the owners and with the assessments and taxation of farm properties in the same counties.

To sum up this necessarily brief discussion, we need not much concern ourselves, for some years at least, with mere large aggregations of capital independent of monopolistic advantages. So far as they will survive if stripped of all special privileges not enjoyed by you and me, it will largely be because they have won the right to survive through superior industrial service. But that feature of our strongest trusts which gives them their enormous and unfair advantage in the race, is their possession of immensely valuable special privileges in a dozen forms. Unless these, with the exception of patents, can be destroyed, all ideas of fair play in business, and all reason to believe that the survival of the strongest is at the same time the survival of the fittest, will be gone. The result would be calamitous indeed.

MAURICE H. ROBINSON: A partial analysis even of the so-called trust problem must necessarily recognize its complex nature. It naturally comprises, first, a study of the evolution of the industrial organization from a simpler to a more complex form; second, an investigation of the power of such organizations over the industries of the country, the means used to achieve a partial or complete control in its particular field, and the effects of this dominating influence upon the production and distribution of wealth and; third, the sphere of the State in protecting the public welfare and the means by which such protection may be most wisely and permanently attained.

The definition adopted by Professor Adams performs a double service: it limits the discussion to a consideration of those organizations that possess a dominating influence in a particular industry and consequently excludes a large number of consolidations commonly

called trusts from the inquiry; and it recognizes that a "dominating influence" may be secured in either one of two very different ways: (a) by the growth of one business organization until it crowds its rivals to the wall or forces them to submit to its leadership as a price of its continued existence; or (b) by the amalgamation of practically all the competing units into one organic whole, more or less permanent and effective.

With these preliminary considerations in mind I wish to limit my remarks to a necessarily brief discussion of two lines of inquiry raised by the paper, since upon our answer to these fundamental questions must depend our attitude to the trust problem and its legal regulation.

I. Are trusts a natural growth? (a) If trusts are a natural growth as an incident of the "crowding out" process, the results ought to be evident in the increasing size of the producing units and their decreasing number from decade to decade. Unfortunately our census statistics relating to manufacturing are not arranged with this purpose in view and therefore methods must be crude and results less exact. The tendency may nevertheless be discovered in a general way and with more exactness in certain industrial groups. Taking the manufacturing industries as a whole the maximum size seems to have been reached in 1890. In 1900 on the average, each establishment employed a less number of men, paid less in wages, used less materials, turned out less value in product, and employed only slightly more capital. The same is true of a large majority of the specific industries. This tendency does not run through all the industries of the country, however. There are several groups in which the units steadily grow less in number and larger in size decade by decade. Some of

the more marked cases, comparing the number and capital investment in 1880 and 1900, are:

Agr'l implements,	40%	less in number,	175%	increase in av. capital
Cordage and twine,	40	"	200	"
Malt,	33	"	190	"
Matches,	40	"	175	"
Linseed oil,	40	"	200	"
Floor oil cloth,	28	"	100	"
Safes and Vaults,	12	"	150	"
Salt,	40	"	233	"
Iron and Steel,	25	"	150	"
Blast Furnaces,	33	"	50	"

In the above named industrial groups, together with some others including the manufacture of oils, gas, textiles, liquors, starch, paper, chemicals, tobacco and others, the number of independent plants has constantly been decreasing while the investment of capital has been increasing at a rapid rate. Consequently the average investment is much larger per plant and the output is proportionally increased. Such industries may be appropriately called the "consolidating industries." In a general way they have the following characteristics:

(1.) The goods are of uniform quality and in staple use.

(2.) They require an exceptionally large investment in plant and machinery for profitable production.

(3.) They depend for success more largely upon the perfection of their organization than upon the "industrial taste" of their managers.

While the tendency to consolidate as a result of the greater economy of the larger establishment exists, there is as yet no indication that it will ever result in the domination of one establishment in any industry. The larger plants are apparently reaching the size that gives the maximum economy and when that is reached this process will come to an end. In other words, a mo-

nopoly in any one group must come, if it comes at all, as a result of the union of competing units and not through the destruction of the weaker by the stronger.

(b) Whether the tendency to unite for common ends is an inborn characteristic of the race or an acquired trait may well be left to the students of the science of society. At the present time it is quite universal: in politics, the union of parties and states; in economics, the amalgamation of employers and of laborers; in society, the formation of clubs and their federation into national organizations. The formation of trusts is then not an isolated phenomenon, it is a part of a universal tendency. It is not only everywhere present but it takes on every possible variety of form from the simple association to the holding corporation. The association —such as the Merchants' Association of New York— has indeed no monopoly power but is nevertheless of very great importance owing to its socializing effects and its tendency to prepare the way for a stronger organization, the combination or pool. The combination is the characteristic form in practically every country where trusts exist except England and the United States. At the same time it has a much more powerful influence in this country than is generally admitted. It is effective only while it includes a large percentage of the producers in any industry. Its chief end is to control directly or indirectly the price of its product and the amount of the output. The combination grows into the company, wherever the legal system permits. The company form not only allows monopoly but in addition ensures permanence and whatever economies a strong and efficient organization make possible. Is there a tendency for the combination and the giant corporation, one or both, to dominate the in-

dustries of the country and of the world? The census of 1900 shows that in the United States out of over 500,000 separate manufacturing establishments, about 12 per cent in number were in the corporate form producing approximately 60 per cent in value of the manufactured goods. The corporate consolidations, however, did not control much over one-fourth of the total invested capital, while those which exercised a dominating influence certainly represented a much smaller fraction still. The extent and influence of the combination in this country cannot be determined with accuracy owing to the fact that such organizations are illegal and therefore largely secret. Their power is, I believe underrated, and I question whether the "dominating influence" of some of the so-called trusts is not due as much to a combination with the outsiders as it is to their own independent power.

Is there a casual relation between the two tendencies just described? It will be noticed (1) that every one of the great trusts have been formed within an industry where there already existed a strong tendency to form fewer and larger producing units. (2) Few, if any trusts have been formed in those industries where such tendency is absent and further such organizations have kept re-organization committees and receivers busy. In certain cases trusts have been abandoned because, as stated by the president of one such, the business could be more advantageously conducted by the constituent plants independently.

In the light of these and other facts which might be cited if time permitted, I am forced to the conclusion that very large organizations possessing in some cases at least a certain degree of monopolistic power are a natural growth under our *laissez faire* economic sys-

tem. With our legal system adjusted to the new economic conditions as suggested by Professor Adams in his paper and by Professor Meyer in his remarks, it seems probable that while the giant organizations would still persist they would be stripped of most of those dominating traits which are proving dangerous to society and are likely in the end to cause their own downfall.

II. Are trusts productive? A trust as defined is a partial monopoly—the monopoly power being due to the control of the major portion of the output of a particular industry. It is a monopoly *in posse*, not *in esse*. It must maintain this dominating position or lose its distinctive characteristic as a trust. To maintain this position it must either:

(1) Produce at a lower cost than its competitors, or,

(2) Control the industry by the use of piratical methods, or,

(3) Rely on the protection of the government or special privileges from related industries, such as the railways.

In the past, the trusts have apparently depended upon all three of these methods. Whether beyond a certain point capital in itself is an aid in reducing the cost of production may be doubted. Such a conclusion is not equivalent to asserting that in a trade war an abundant treasury is to be despised. We have been passing through a stupendous competitive warfare and in such a warfare capital counts. Under such circumstances success does not necessarily come to the company that produces at the least cost, it comes rather to the one that can endure the longest or fight the hardest. We have been allowing the "big fellow" armed to the teeth to meet his unprotected antagonist in the ring, saying

"hands off" and afterward present the ridiculous spectacle of investigating why the little fellow is knocked out in the first round. For such a situation the nature of the remedy is clear, although the exact form it must take can only be solved by experience.

When all this has been granted and it has been further admitted that many of the trusts have been living upon favors from the government or the railways, it may still be asked, are not the trusts efficient producers? Two lines of argument may be used:

(1) Statistics of failures show that an exceptionally large proportion of the whole occur among the smaller plants, and in this connection it may be noticed that Professor Adams has admitted that organized labor by raising the price of its wages forces the smaller producers to the wall. This means that the larger producers are operating at less cost.

(2) It is generally admitted by both business men and economists that efficient production depends upon labor, capital, methods of production, and organization. An increase in the efficiency of labor cheapens the cost of production, so does better technical methods, so does a more efficient organization. The trust is a form of organization and it is at least possible that such a form may prove more economical than that which it has superceded in certain lines. If the preceding analysis is at all correct however, such economies as may be effected through a more efficient organization are in their nature differential gains not monopoly profits. Such gains are due to a better organization and can be retained only so long as such efficiency is maintained. They are thus a perpetual incentive to the continued economical organization of the productive forces.

W. G. Langworthy Taylor: I believe that the important fact connected with the trusts and their evils is not so much the combining of large firms and corporations into larger ones, as the direct and plain fact of over-capitalization. This is the cause of commercial crisis because it is the cause of the inflation and rise of prices about which we hear so much before crises. If I had time, I believe I could demonstrate that the rise of prices is due to the over-capitalization. I do not say that any peculiar blame lies upon the promoters—not, at least, in excess of that which lies upon other classes. The over-capitalization seems necessary in order to bring out the individual surpluses and sell the stocks. Hence the investing public is made *particeps criminis*; nor do the laborers escape guilt, with their extortionate demands at the very moment when the financial waters are roughest. But, confining ourselves to finance, the connection between over-capitalization and prices, and hence with crises, lies evidently in the implied high returns. It is supposed that very large, impossible, returns will occur and will continue; large subjective value of products is promised and believed in. Now over-capitalization is simply the financial form taken by these promises. High returns mean high prices for stocks and bonds, if the rate of interest is to be kept down to the "effective desire of accumulation." But these large nominal capitals mean a big demand for present goods; they are the means of circulating present goods, and hence the inordinate rise of prices of commodities—the "present goods" of Boehm-Bawerk.

My object in speaking to the question, however, was to call attention to the resemblance of present phenomena to those of the crisis of 1873. I have recently

been looking at a publication that appeared shortly after the crisis of 1873 in Germany, by one Glagaŭ, a very racy writer, who collected in his notes an account of a very large number of separate *Gründŭngen* or promotions during the *Schwindelära.* I have looked rather carefully through these accounts and I have failed to find in them any case of considerable combination. They were all cases of over-capitalization *simpliciter.* No one can claim that 1873 was not a typical crisis, with the full-fledged phenomena of inflation, high prices and their subsequent fall. I merely draw this parallel in confirmation of what has been stated here by Professor H. C. Emery, and, I think, by others, that combination is not the essence of the promotion evil.

Jacob H. Hollander: I have been disappointed in the extent to which the discussion has concerned itself with the technique of trust organization and administration, to the neglect of what seems the more vital, and certainly the more fundamental problem suggested by Professor Adams' paper, namely, the theoretical basis of the existence and growth of industrial concentration. Before we can advise wisely as to the necessity and nature of legislative control of the trust, we must first reach some definite conclusions as to whether there be any assignable limit to the size of the modern industrial unit, and as where such limit lies, and what forces determine it. This seems to me the primary concern of economic analysis, and until we have reached more definite and convincing results than those thus far attained, we can give neither intelligent counsel nor helpful service to the legislator or administrator grappling with the so-called "trust problem."

THOMAS N. CARVER: In discussing the supposed superior productivity of trusts it is sometimes forgotten that trusts are not made to produce, but to sell. The trust promoter's sole concern is to sell his securities. This he would not be able to do unless the public believed that the trust would be productive, or was at least intended to produce. But the buying public seems to be about as unsophisticated in such matters as was the rustic who bought the razor supposing that it was made to shave but found that it was only made to sell. Until the buying public becomes somewhat more sophisticated, and loses some of its faith in the inherent superiority of a "big thing," the productivity of a trust will remain a minor consideration in the minds of its organizers.

HENRY W. FARNAM: I do not know exactly what is expected of the person who is to summarize the discussion, but I have tried to meet the requirements of the situation by separating my mind into two compartments. One of them might be likened to one side of a revolving blackboard, which has been carefully sponged in order to receive in an unprejudiced manner the impressions made by the other speakers; on the other side I have endeavored to record and retain a few points which seemed to me might be made in comment upon or supplementary to the paper of Professor Adams. As the discussion has proceeded, the blank side of the blackboard has been gradually filled up with the ideas contributed by the other speakers, while the other side has been gradually becoming cleaner, as one idea after another which I had thought of has been advanced by some one else, and been expunged from my talk. Acting on this conception of my task I shall first endeavor as

fairly as possible to sum up in a few words the leading points made by the preceding speakers, especially as far as any general agreement can be traced. I shall then add a few suggestions of my own on points which have not thus far been touched upon.

When the Chicago conference on trusts was held in 1899, a committee on resolutions was appointed which stated in its report that its members had different views on the problems to be discussed, and recommended a resolution to the effect that "it would be inexpedient for it (the conference) to adopt resolutions purporting to declare the sense of the conference upon any aspect of the subject discussed." When the subject of trusts was announced for discussion by this association, I very much feared that the end might be a similar agreement to disagree. In this I have been agreeably disappointed. If I have rightly understood the speakers, almost all, if not all, would agree regarding certain leading points, although their agreement on many of these would seem to involve a certain disagreement with the views expressed by Professor Adams in his very able opening address. The points of apparent agreement which have most impressed me are the following:

(1) The speakers have generally based their arguments upon a study of the facts, rather than upon a consideration of the psychology of economics. Certainly they have not shown as great a fear as that expressed by Professor Adams of the dangers of monopoly involved in the trusts.

(2) They are more inclined to think that these evils will be held in check either by potential competition or by a farsighted regard to their own interests on the part of the trusts.

(3) As regards legislative measures, none of those who have spoken would seem to be in favor of abolishing the trusts altogether, but would rather favor some legislation which would limit their power for evil. On the other hand, no one, with possibly a single exception, would favor a *laissez faire* policy.

(4) There also seems to be a general agreement that the exhibition of promoters' profits, inflated capitalization, and stock-jobbing devices, which we have recently witnessed, while deplorable in the extreme, is not necessarily connected with the trust systems, but has shown itself under various forms in other periods of speculation. One must indeed be bereft of historical sense if, standing in the city of New Orleans and in the old Province of Louisiana, he did not recall Law and the Mississippi scheme and the undigested securities of one hundred and eighty-four years ago.

Professor Adams has laid a good deal of stress in his paper upon the danger of monopoly in trusts, and there is no doubt of the tendency on the part of trust managers to create for themselves an exclusive or nearly exclusive field. But is this really the essential feature which has aroused so much popular feeling? I think not. The mere fact that we should use to designate these combinations a term which no longer describes the form under which any one of them is now organized, and under which very few have ever been organized, confirms my view. In addition to the fear of monopoly, what especially arouses indignation at the trusts is, in my view, the fact that by a lawyer's trick a time-honored English legal term, which implied above all things responsibility, has been used to mask a form of combination, the essence of which is irresponsibility, that is irresponsibility to the government and to the public.

I believe that the monopoly feature of trusts is very generally subject to limitation arising from the nature of modern industrial organization, so that while there may be exceptions the consumer is not the one who has most to suffer by them. Many examples could be given to show the practical operation, either of potential competition or, where this does not exist, of self-restraint exercised entirely through motives of far-sighted self-interest. Thus I could instance a railroad, which has practically a monopoly of transportation in a large section of the country, and which formerly seemed to exploit that monopoly with a single eye to the stockholder's dividends. The more modern men who have come into its management now take the view that, while they mean to continue paying dividends to stockholders, the welfare of such a road depends upon the welfare of the country which it serves, and that it is therefore, for the interest of the road to make such rates as will develop the business and traffic of that country.

The policy introduced into many gas companies in recent times, though perhaps stimulated by the competition of the electric light companies, is another instance of the tendency of the modern business man to make his gains out of small profits on a large volume of business, rather than out of large profits on a small volume. Some inquiries which I have made into the operation of the sugar trust have convinced me that here too, while the trust certainly has an advantage in bargaining power on account of its large transactions, it is not able either to depress the price of the raw material or to raise the price of the finished product as much as has been often assumed. An instance just mentioned to me by Mr. Marburg is also in point. He tells me that the formation of the tobacco trust has been the means of

greatly stimulating cotton raising in the vicinity of Durham. The general fact which applies to most of these cases is that modern methods of production involve the use of a large fixed capital, and that to utilize this involves a very wide market, while to gain this market it is necessary that the prices should be moderate. Monopoly, therefore, under modern business conditions and under modern far-sighted business management, means a very different thing from what it meant when the Dutch East India Company destroyed half of the spice crop in order to raise the price of the other half, and it seems to me that Professor Adams' plea for the higher commercial education might be based, not only upon the ground that it would encourage competition, but also upon the ground that it would encourage far-sighted, as distinguished from short-sighted business management in our large corporation.

The greatest evils are, therefore, perhaps ethical, and legal, rather than strictly economic, and in dealing with this phase of the matter I venture to say that the forgotten man is the corporation lawyer. It is he who devises the various forms of organization under which great corporations, while conforming to the letter of the law, succeed practically in doing what they please. Now, the corporation lawyer always has and always will have a great advantage over the average legislator, partly because he is a much abler, more highly trained and more highly paid man, and partly because it is easier to work a hole through the meshes of the law than to make a general law so tight that no hole can be found in it. It is, therefore, very important that our laws should be such as not to tempt the respectable and honorable lawyers and corporation managers to try to evade them. This means that they should be simple not fussy, that they

should aim at the real root of the evil not at its symptoms, and that they should keep in mind the social point of view which was so ably presented by President Seligman in his opening address. By that I mean that they should try to encourage a type of socially useful rather than socially harmful corporation managers. As far as these managers are broad-minded, striving to effect economies, and adopt new methods in production; they may, I think be fairly said to be socially useful, whatever we may think of the size of the compensation which they get for themselves. But it cannot be socially useful to be tricky, vindictive, unscrupulous, dishonest or corrupt. This is not the place, nor am I prepared, to outline in detail a law for the regulation of trusts. I may, however, venture the suggestion (made with that diffidence which Professor Goodnow said was characteristic of the lawyer in speaking on a subject which had not yet been passed upon by the Supreme Court), that in order to secure the necessary uniformity, I believe that we should resort to federal legislation rather than rely upon state legislation. I also believe that our experience with regard to the regulation of banks under the national banking system points out the line of most profitable progress. We are now going through a period of wild-cat corporation finance, corresponding to the period of wild-cat banking which preceded the Civil War, and while I do not shut my eyes to the great constitutional questions involved in federal legislation, I hope we may find the means of solving them, as we have solved similar questions in the past.

A THEORY OF SOCIAL CAUSATION

FRANKLIN H. GIDDINGS

The human mind cannot rest satisfied in a chaos of unassorted facts. Some arrangement of the materials of knowledge it must make. In the degree that it gets beyond arrangements that have no real significance, to those that disclose great processes of causation, and establish their laws, it becomes scientific.

The simplest categories by which facts can be arranged are those of time and space. Chronological series and spacial descriptions are the resources of the childish mind, unable to analyze things sufficiently to discover their essential resemblances. They are the resource of great minds also, confronted by facts too strange or too complicated for other disposition. When at a loss where else to place a novel fact one puts it in a pigeon hole, under a date, or under a letter of the alphabet.

The first step toward science is taken when, among facts grouped by time or space, we observe resemblances of structure, or resemblance of activity, of function or of conduct. For result we have the classificatory stage of science, the beginning of a morphology and a physiology. When observations upon matter and its behavior were removed from the categories of days and seasons, of accidental disposition in this or that region or position, they ceased to be magic or alchemy; in an elementary way they began to be physics and chemistry. In like manner, the observed facts of plant and animal life, through studies of structure, and the resulting classifications made by Linnæus and Cuvier, became descriptive

botany and comparative anatomy. They were no longer the vague natural history, half description, half anecdote, of Buffon and his predecessors.

Only after the work of classification has been accomplished ; only when the great types of structure, and the great modes of function have been revealed, is the mind able to penetrate further beneath the surface of things, and to discover there, underlying types and modes, the continuing processes, and the active causes of change and of grouping. When these discoveries have been made, the facts, correlated with general processes and with true causes, have become science, fully developed in method, and satisfying the craving of the mind for explanation in the one possible sense of that word, namely, the establishment of logical relations between instances and principles.

The more numerous, varied and complicated the facts found in any assemblage of observations or of testimonies, the more difficult it is to discover among them any other groupings than those of the time and space categories ; the longer we have to wait for that arrangement of them which can properly be called science.

Of all known assemblages of facts those pertaining to the social life and organization of man, in the past and in the present, are the most numerous, the most varied, the most intricately complicated. It is no wonder, therefore, that slow progress has been made in arranging them otherwise than by the simple categories of time and space. These have determined a subdivision of the whole field into three great branches of concrete social knowledge. Social statistics, as Seignobos, in his study of historical method, has said, is primarily separated from history not by that difference of method which also

exists, but by the mere circumstance that social statistics concerns itself with social facts under observation in the present, while history concerns itself with social facts observed and recorded in the past. In like manner, while one way of stating the delimitation of history from ethnography would be to say that history studies societies that have arrived at civilization, while ethnography studies societies still uncivilized, the more familiar statement is, that ethnography studies man as geographically distributed, while history studies him in so far as he has had a chronologically ordered and recorded career. Furthermore, in the internal arrangement of the facts making up each of these branches of social knowledge, the space and time categories still hold sway. Ethnography is only now emerging from an arrangement of its materials according to a merely geographical scheme. The great bulk of all written history is still frankly chronological in its arrangement; and social statistics has not to any great extent gotten beyond the simplest spacial categories.

Yet, within recent years, there has been a growing restiveness under these limitations, and not a decade goes by without attempts to grapple anew with the problem of a more scientific comprehension. Some progress has been made towards substituting the categories of structure and of function for those of time and space, as was done in natural history when the classification by morphological types arose. For example, in ethnography we have attempts to group the known facts of primitive society according to various psychological principles and schemes of culture. We have the subdivision of historical materials into cultural and institutional history, and, more minutely, into religious, economic, juristic and political history. In social statis-

tics we are beginning to recognize distinctions that mark off the statistics of population proper from statistics of the social mind; these from statistics of social organization; and these, in turn, from statistics of the social welfare.

Even this measure of progress has not satisfied. From time to time the attempt is made to get below classification itself, and to discover in social evolution an orderly process, appealing to the rational intelligence, and to find its underlying laws and causes. This is the explanation of the ever-recurring interest in some scheme of the philosophy of history, or in some principle of interpretation. The great concept of universal evolution, which has brought order and harmony into the sciences of life and of mind, has powerfully stimulated a desire to develop the concrete social sciences of ethnography, history and statistics, into true explanatory sciences, and to fashion their materials, by correlation with principles of causation into a reasoned science of sociology.

Not less significant, furthermore, is the circumstance that of these various attempts those that have contained any element of mysticism or of transcendentalism have fallen into discredit. He would be a bold man who today, after a thorough training in the best historical scholarship, should venture to put forth a philosophy of history in terms of the divine ideas, or to trace the plan of an Almighty in the sequence of human events. On the other hand, those interpretations that are characterized as materialistic, and that try to find the causes of social evolution in the action of the physical environment, or that, seeking explanation in the tremendous process of the struggle for existence, find an interpretation in the circumstances of man's economic life, are daily winning serious respect. In so far as they fail to

satisfy, it is because they have not yet shown how, out of such materialistic causes, there emerge the complex phenomena that take shape in cultural activities; in the infinitely involved psychological aspects of man's collective life; and, above all, in those sublime idealisms that bear multitudes of human beings into struggles that seem to sacrifice all considerations of utility, of prudence even, in the pursuit of some glorious aim that appeals only to the soul.

Is the problem insoluble that is thus presented by the existence of social idealism in a material world? I do not think so. Believing that in certain elementary social facts long recognized as interesting, but not always seized upon as significant, we have the data for correlating the idealistic aspects of social evolution with its material basis, I venture to bring forward tentatively a theory of social causation. I hope that it may contribute something toward a rational ordering of the great mass of materials presented to us by ethnography, by history, and by statistics, in a science of society; and that, as the principles of such a science gain acceptance, it may pay its debt to these branches of knowledge by making over to them categories of arrangement and helpful working hypotheses.

At the outset we may take a hint from the psychologists. Scientific psychology has found one way, and only one, to avoid any assumption of either materialism or idealism, in the philosophical sense of those words. It consists in centering attention upon the correlations of material and mental phenomena, rather than on the nature of things in themselves. External things are conceived as stimuli, and internal processes are conceived as responses to stimuli. Causation within the realm of

mental phenomena, is thus regarded as psycho-physical. It is a process in which the mental order changes in definite ways corresponding to changes in an external order. To discover these ways and to formulate their laws is a sufficient scientific achievement in psychology. It is unnecessary to raise any question of the identity, or of the duality, of mind and matter.

This conception we must carry over into sociology. Causation in society is not at one extreme a merely physical process; nor is it, at the other extreme, an outworking of some mysterious entity called free-will, that is in no wise conditioned by the external world. Like the activity of the individual mind, it is a psycho-physical process, in which physical stimuli, on the one hand, and motor-reactions, accompanied by feeling and by thought, on the other hand, are inseparably associated.

Accepting this hint, we make the initial assumption that the institutions of human society, and all the events of history, including the migrations of men from place to place, the great enthusiasms, the intellectual awakenings, the wars and the revolutions, may be regarded as responses to varying stimuli, and that they are governed by certain laws of combination, or by certain facts of resemblance or of difference among the minds responding.

The illuminating aid of concrete example will help to make this somewhat unfamiliar way of looking at the subject more definite and real. In the codes of ancient law that have come down to us from peoples emerging from a tribal into a civic life, there are pictures of spontaneous social action that, by reason of their relative simplicity, enable us to see the essential nature of social processes more distinctly than we do when we observe the exceeding complexity of modern institutional activ-

ity. Of such pictures I know of none more clearly reflecting the social process as a psychological phenomenon than do those curious and beautiful triads of Dyvnwal Moelmud that are included in the Ancient Laws of Wales. In simple language, almost poetical in form, the various occasions that draw men together in mote, or meeting, are described. Here are examples:

5. There are three motes of mutual protection: an outpouring mote; mast gathering; and co-tillage. Herein the hand of everyone is required to assist according to his ability.

6. There are three horn motes: the assembling of the country by elders and chiefs of kindreds; the horn of harvest; and the horn of battle and war, against the molestation of a border country and strangers.

14. There are three motes of consociation: a convention of a country and elders, arranging the laws and judgments of a common country; bards as teachers of sciences, where they assemble in session; and the congress of a kindred, at a meeting for worship on the principal high festivals.

15. There are three motes of imminent attack: the inroad of a border country enemy; the cry, or the horn, of murder and waylaying; and a hamlet on fire: for assistance is required from everybody.

16. There are three horns of joint mote: the horn of harvest; the horn of pleadings; and the horn of worship.

17. There are three motes of commotion: the horn of the country; ships from a strange country effecting a landing; and the non-return of the messenger of a country and elders from a foreign country.

18. There are three motes of request: for tillage; festal games; and burning of woods; for, upon a request, they are not to be impeded.

21. There are three motes of pursuit: after a wolf; after thieves; and after a mad dog; and all who shall hear the cry are to assemble together.

22. There are three outpouring motes: the approach of strangers without permission; the depredation of a border country; and a pack of wolves.

26. There are three motes of banishment: for murder and waylaying; treason against the state, or treachery to the country and kindred; and irretrievable spoliation; for it is required of everybody, of every sex and age within hearing of the horn, in the direction taken, to accompany the progress of that exile; and keep up the barking of dogs, to the period of putting to sea, and until the one banished shall have gone three score hours out of sight.

The social process revealed by these pictures of a simple community life does not admit of misinterpretation. Not only is each example of collective action a response to stimulus, but it is even so conceived by the writer of the triads, who, in turn, represents the people as themselves thinking of the social process in such terms. The horn, the cry, the alarm, are deliberately used as stimuli, supplementing the stimuli that would be afforded by mere perception or rumor of certain events or opportunities. The hastening together of the people in public mote or meeting, in its turn, is not only a spontaneous response, but even one that has in it the elements of conscious knowledge that such response is expected, whenever the horn or other alarm is heard.

From these concrete examples we must pass to a broader and somewhat more abstract view. Organization and institutional life must be regarded not as things, but as modes of habitual activity among men. A government, a corporation, a household, is a group of persons regularly doing certain things in certain ways. All therefore may be regarded as phenomena of collective conduct. Conduct, in its turn, as Mr. Spencer has shown in the "Data of ethics," is merely one part of mental activity. It is a consciously controlled aggregate of acts adjusted to ends. The other part of mental activity is made up of more or less unconscious deeds or experiences, including impulsive outbursts and instinctive acts.

One further step brings us back to our fundamental generalization. In the last analysis the entire mental process is an infinitely complex series of responses to stimuli. Not all responses, however, are collective.

Not all are like responses by many individuals to the same given stimulus. But if, as individuals, men were always moved to act in wholly unlike ways; if they were moved to feel differently and to think differently on every subject, their conduct would be without order. There would be a state of affairs far more chaotic than any state of nature imagined by Hobbes or Rousseau. There would be no common interests, no sympathies, no public opinion, no coöperation. All of these things are agreeing responses to common stimuli, and all are of the essential phenomena of society. Society, then, conceived in terms of its fundamental process, may be regarded as a complex aggregate of agreeing responses to certain stimuli that act upon many men in like ways.

All things, however, are relative, and that which from one point of view is general, from another point of view may be special. While like response to stimulus is the general form of social action, it is at the same time a special form of wider processes, constituting universal evolution. In human society, as in the realms of animal life and of vegetation, we see processes of selection and of survival; processes of adaptation; and processes of conflict, resulting in subjugations, exploitations, or transformations of the weak by the strong. And we know that all of these phenomena are modes of that ceaseless equilibration that goes on between bodies highly charged with energy, and bodies undercharged. It is natural, therefore, that we have theories of society in which all changes are baldly stated in terms of conflict, as in the sociological systems of Gumplowicz and Novicow, or as in the Marxian theories of exploitation. These theories are unsatisfactory because they ignore a certain determining, directing, controlling step in the series of transformations. Steam

escaping by the safety valve, and steam exhausted back of the piston head—both are transformations of energy, but they produce different effects, because they enter into different correlations. In society all the forces of nature and of mind work through the correlations of stimulus and of like or unlike response. Every conflict and every selection is cast into a certain form, and the form determines results. Every conflict is a group of responses to stimulus, but it may consist of responses to differing stimuli, or of differing responses to the same stimulus, and the sociological consequences of this difference may be momentous. Again, in society every selection, as truly as every conflict, is a group of responses to stimuli, but it may consist in unlike responses to the same stimulus, or, in responses that as far as they go are alike but are unequal. In the one case we have all the possibilities of toleration and of liberty, notwithstanding disagreement. In the other case we have all the possibilities of subordination and of exploitation.

The great forces, then, of nature and of mind do not pass over into society except as they are correlated or organized in the phenomena of more or less like response. We have still to enquire, however, whether the energizing forces pass into the phenomena of stimulation and response directly, or only through certain antecedent groupings in the phenomena of the physical world. In other words, can we carry our theory of social causation back to firm foundations of physical data, in those groupings of objective fact which, collectively, we call the material environment?

Happily it is possible to answer this question, because it is obvious to even a superficial observer that the

stimuli themselves to which men collectively respond are of two great orders.

The most immediate and the most important stimuli of modern social life are products of past responses to yet earlier stimuli. The very arrangements under which we live, the groupings of human beings, their ideas and purposes, their aims, their ideals, their laws and institutions are ever-present, ever-potent causes of continuing collective action. Of all the stimuli that move men to mighty and glorious coöperation, none can be compared with a great ideal. The ideals of liberty, of freedom, of enlightenment, lift men to-day in gigantic waves of collective effort like resistless tides of the sea. American life pre-eminently has consisted in responses to these ideals. The Declaration of Independence was an ideal, and nothing more; but the response to it was the successful struggle of a people to establish itself forever among the nations of the earth as a republic of men pledged unalterably to civil liberty. The federal constitution, drafted by Hamilton and his co-workers, was a stupendous ideal. The response to it was its acceptance by thirteen commonwealths, and subsequently the rising of a mighty people to maintain and to consolidate for all time, the indissoluble Union.

But back of all these secondary stimuli, products of past social life, are original stimuli presented to every mind by the presence of fellow beings, by the concrete objects of nature, by the events and the order of nature. These collectively are the environment. As environments differ in fundamental character and in complexity, so differ the original stimuli to which the minds of men respond in collective action, and the possibilities of institutional life.

Accepting the unmistakable distinction between primary and secondary stimuli of social activity, the prime requirement laid upon social theory is revealed. A scientific theory of social causation must show how the primary stimuli give rise to the secondary. Above all, it must disclose the process through which the great ideals arise. It must reveal the successive stages through which the stimuli collectively making up the physical environment create ultimately the stimuli and the responses of idealistic conduct.

Here, then, is our whole hypothesis in restatement. Sociological study is the scientific examination of all those phenomena that proceed from like responses by many individuals to the same stimuli. A theory of social causation may be constructed if we can discover the conditions under which like response is inevitable or possible; the laws of arrangement of combination according to which various kinds of stimuli become operative; and the combinations of human activity that must follow as the extent and degree of like response are more or less. In the theory here presented the ultimate causes of society are assumed to be objectively the great physical processes of equilibration, conflict and selection, and subjectively the elemental appetites and passions of the animate organism. But it is further assumed that physical and mental forces create society only as they are correlated and combined in certain concrete forms. Combined in various types of environment the physical forces are complexes of primary stimuli. As such they determine; first, the character, the extent, and the groupings of primary response; and secondly, the genesis of secondary stimuli. The various correlations of response are the phenomena of conflict, adaptation and

selection in their social aspect. The combinations of response are the modes of coöperation, the great processes of history, and the forms of social organization.

Essaying now to expand this theory into a more intelligible detail, we necessarily begin with an attempt to discover what features of the physical habitat of a human population are significant, and through what channels or groupings of concrete fact they exert their controlling influence upon collective aims and activities.

The earlier theories of the relation of environment to national life and character placed emphasis upon the direct influence of soil, climate and topography upon mental and institutional life.

Montesquieu hardly got beyond this simple view of the problem. He attributes a relatively great boldness to the inhabitants of cold climates, and to boldness he attributes frankness and a lack of suspicion and cunning. To the enervating influence of great heat, and the deliciousness of rest in a hot climate, he attributes the belief of the Hindoo that "repose and non-existence are the foundation of all things, and the end in which they terminate." From these temperamental effects of climate Montesquieu thought that he could derive systems of laws and institutions. His observations, nevertheless, were keen and significant, and doubtless much important scientific work is yet to be done in following out the suggestions in which "The spirit of the laws" abounds.

Buckle, perceiving that the action of environment upon national life is more complex than Montesquieu represented it, laid emphasis upon those influences of nature that develop on the one hand the emotional, on the other hand the intellectual habit. Regions in which nature is uncertain, violent and destructive, especially

where earthquakes, volcanic catastrophies and tempests abound, inspire terror and superstition, and thereby unfit the mind for scientific research and for the systematic conquest of the external world. Regions that are tractable, having seldom more startling occurrences than the regular succession of seasons and the relatively mild storms of the temperate zones, awaken an intellectual interest; and by suggesting a constant order in nature, they lead the mind on to scientific comprehension. Buckle also made the distinction between primary and secondary civilizations, and drew attention to the exceeding importance of the relation existing between any secondary civilization and that environment to which we must apply the adjective "social" rather than "physical."

Spencer, in the first volume of his "Principles of sociology", comprehensively reviews the influence of climates and topographies upon the emotional and the intellectual natures of men, and he calls especial attention to the relation of the flora and the fauna to the possibilities of social evolution. He lays chief stress, however, upon the sociological environment, since it is in the relation of a tribe or a nation to its stronger or weaker neighbors that the causes determining its type of organization as military or industrial, seem to him to be found.

In those later studies that have taken the form of an economic interpretation of history, it is an indirect rather than a direct action of the environment that finds recognition. Situation and resources mould the social organization; first, by determining the character of the predominant industries; and, secondly, by determining the prevailing form of property, as real estate or free capital.

The theory that I wish to submit differs from all of these. I shall try to show that the really significant phenomenon is found in the relation of the physical environment to the composition of its population. My propositions are, first, that the character of the environment determines the composition of a population as more or less heterogeneous, more or less compound; and second, that the composition of the population determines its mental characteristics, its potentialities of coöperation, its capacity for progress, its ideals, and its organization as more or less democratic.

To develop these propositions, let us begin with a phenomenon very simple, very obvious, yet very far-reaching in its consequences. A physical environment has, or it has not, the power to attract inhabitants to itself and to keep them. In America we are witnessing the most remarkable example in human history of this immediate relation of population to environment. By hundreds of thousands men and women from the older lands are drawn here by the bounty of nature, underlying that varied economic opportunity which this nation affords to its people. Quite as striking as the mere numbers of immigrants to America, however, is the varied composition of our foreign born population. Every nationality is included. But the geographical distribution of the foreign born shows a marked difference of one region from another in degree of compositeness. The North Atlantic division is heterogeneous in the extreme. Thirty-six per cent of its foreign born are of English-teutonic blood; twenty-nine per cent are Celtic; eight per cent are Celto-latin, nine per cent are Ibero-latin, and seventeen per cent are Slavonic. The North Central division has an overwhelming preponderance of Teutonic stocks. Seventy-one per cent of its

foreign born are of English-teutonic bloods. Only twelve per cent are Celtic; only three per cent are Celto-latin, less than two per cent are Ibero-latin, and ten per cent are Slavonic.

Environments are of two fundamental types in respect of their power to maintain society; those that are so poorly endowed with resources that they can maintain and attract only relatively small numbers of inhabitants, and those that, being richly endowed, support large populations of the native born, and tend to draw a large immigration from elsewhere. Each of these types of environment, in turn, presents two well-marked subdivisions: the isolated, or difficult of access or of egress; and the accessible, a land of ports and open ways, through which the currents of population may easily flow.

The composition of the population can by no possibility be the same in these four types of environment. That which is characteristic of one is unattainable in another. And because the composition of the population is in each case of a certain necessary description, there is a corresponding make-up of the social mind, a certain range of possibility in the succession of historical events, and a certain necessary order of social institutions.

In the environment that is both poor and isolated population is not only sparse, but it is relatively simple and homogeneous in composition. It is maintained only by its birth rate, and it increases only if its birth rate is in excess of its death rate. It is a genetic aggregation. Extreme examples of this environment and of the structure of its population are afforded by the coasts of Greenland, the Aleutian Islands, the southern ex-

tremity of South America, and the interior regions of Australia.

In the environment that is poor but accessible, or, what in this instance is more to the point, admits of easy egress, the population again is a genetic aggregation. The attractions and inducements are not sufficient to bring immigration. But neither are they sufficient in all cases to keep the men born within its borders, and, escape being relatively easy, many of the most energetic emigrate to better lands. Here, in the concrete, the process of selection is seen going on in the form of response to stimulus. The resources of other environments in some degree awaken the desire of all the inhabitants of the impoverished land, but only those that are relatively enterprising and energetic are moved to better their condition. The result is a gradual deterioration of the stock remaining in the land. It is bred from the leavings that have been incapable of efficiently responding to the stimulus of larger opportunities. The most interesting modern examples of such environments are those extensive tracts of upland or hill country in the North Atlantic states, especially in the New England states, that once had prosperous farming populations, but now are inhabited only by unambitious families presenting the unmistakable marks of degeneration.

The third type of environment is that which is both rich in resources and relatively isolated or inaccessible. The interior of the Arabian peninsula, the Hawaiian Islands, the Samoan Islands, and the islands of Tahiti, are good examples. So also are the uplands of Mexico and Peru. Here again the population is a great kinship, a genetic aggregation. It is relatively dense. The birth rate is high, and every inequality of energy

or ability counts in the struggle for existence. The people alike respond to the bounty of nature and develop those simple forms of economic activity that often are sufficient to create a fair degree of prosperity. The isolation of such a population while it lasts determines the whole course of social evolution, but it is relative. Sooner or later, or perhaps repeatedly at long intervals, it yields to migration. An increasing pressure of the native born upon the means of subsistence at length forces some of the more vigorous elements to break through confining barriers, and as conquerors, or otherwise, to seek distant homes; or the natural resources and the acquired prosperity enjoyed by the inhabitants become a stimulus of sufficient power to tempt distant populations to invade and exploit.

There remain environments of the fourth type, richly bountiful in resources and so accessible that men may flock to them from all quarters of the world. Such are the great river valleys of the Nile and the Euphrates, seats of the most ancient civilizations; of the Po, the Danube and the Rhine, highways of the nations from an immemorial past; of the Seine and the Thames; and, in our own land, the Mississippi basin. Such also are many favored coasts, abounding in inlets and sheltering ports. In all such environments population must sooner or later be composite, and the more so if their resources are not only abundant, but also varied.

The composition, however, is determined in the long run by two co-operating processes. Aboriginal populations are overrun by invaders, who come not as individuals, but as organized bands, or armies equipped for conquest. Populations that have attained a measure of economic advancement are now and again overrun by hosts of ruder people that have been dwelling in rela-

tively unkindly habitats. Further conquests also may follow, after civilization has been attained by both the invaders and the invaded, if the civilization of the invaders is still of the military type. When, however, industrial civilizations of the modern type have been reached, further migration is a movement of individuals.

It happens, therefore, that with few if any exceptions the populations of the most favored environments are both compound and composite; compound as being made up of successive strata of conquered and conquerors, and composite, as being made up of immigrant individuals scattered among the native-born. In time all of these elements are in some degree amalgamated. The amalgamation of invaded and invaders, however, is determined largely by the physical characteristics of the region itself. If they are such as to tempt the invaders to scatter themselves throughout the land as local overlords, while at the same time maintaining a general distribution of the invaded or conquered, the possibilities of amalgamation are far greater than when for any reason either stratum is geographically concentrated. This seems to have been the history of the thoroughgoing amalgamation of Celtic and Teutonic elements in the midland and western counties of England.

When an immigration of individuals begins to bring important additions to a compound population, the foreign-born element itself may be more or less composite. And this circumstance again is determined by the character of the physical environment. If the natural resources, while great, are all of one kind, and especially if they are predominantly agricultural, the inhabitants are far more homogeneous than if the resources are in mineral wealth, or, above all, if they are varied, including commercial and manufacturing oppor-

tunities. Thus, we have seen that the foreign-born population of the northern Mississippi Valley is predominantly Teutonic, while that of the North Atlantic states is composite in the highest degree. Practically, however, an environment of homogeneous resources is usually but part of a larger geographic unity that is occupied by one entire people, and that in the aggregate includes resources of varied kinds. This integral geographic unity inevitably has a population that not only is largely congregate, rather than genetic, in origin, but that also is in a high degree composite.

Now we have to turn from predominantly physical phenomena to consider the mental resemblances and differences, the sympathies and antipathies, the agreements of thought and purpose, the concerted volition, the forms of co-operation, and the social bonds that arise in various populations.

Peoples dwelling in environments of the first two types that have been described are mentally, as well as in blood, homogeneous. They have been subjected to like experiences, and have developed like qualities of nature, and like habits of thought. Undisturbed by the external world, they lead uneventful lives. There is among them a strong sense of kinship. If natural resources are sufficient to sustain a fair degree of comfort, and degeneration through emigration of the more energetic individuals has not yet begun, the people are a sympathetic, kindly folk. They may not be keenly aware of their mental homogeneity because nothing happens to call attention to such possibilities of difference as exist in populations of the composite type. Co-operation is spontaneous, and the chief social bonds are kindliness and neighborly helpfulness. The social organization is simple.

The inhabitants of an environment of the third type are homogeneous in blood, but because population there is relatively dense, individual differences in energy and ability are of some importance, and there are resulting inequalities in the responsiveness of the entire people to given stimuli. Certain persons lead, others follow. There is a tendency to differentiate into dominant and subordinate classes. There are marked differences of intellectual power, yet as a whole the people has a consciousness of kind. It is sympathetic, and engages in spontaneous forms of coöperation. Its social bonds, however, include allegiance to leadership, and the contagious forms of popular emotion.

In environments of the fourth type every variety of mental difference is found, and yet it is entirely possible, in fact usual, that mental heterogeneity is less than ethnic. Men of different bloods may have minds and interests alike. Herein lies the possiblility of assimilation, which tends continually to overcome original differences in a population of miscellaneous ethnic elements. Commonly also, assimilation—which is purely a psychological process—goes on more rapidly than amalgamation,—the physical commingling of bloods. Furthermore, it is entirely possible that mental differences in a mixed population shall be subordinate to great unifying feelings, great purposes, or great ideals, and therefore possible for men otherwise differing to unite their efforts in large coöperative endeavors.

Among these mental and practical possibilities the various aspects of co-operation are of chief interest to the sociologist and the historian, and three of them are of pre-eminent importance. One is the extent to which co-operation is possible among any given people. An-

other is the degree to which co-operation is free and democratic, as contrasted with a co-operation that is coercively enforced by an autocratic power, monarchial or oligarchical. The third aspect is the extent to which co-operation is, on the one hand, mob-like, unreasoning in its form and spirit, or, on the other hand, deliberative and rational.

The key to all problems presented by these varied aspects of co-operation is found in that composition of the population that we have been examining. The people that is mentally homogeneous can co-operate in ways, and, above all, in a spirit, impossible to a people that is heterogeneous.

Certain corollaries derived from the fundamental principle of like response must guide our study. These corollaries are in their nature abstract propositions. They may as well be stated concisely in all their unattractive bareness, because, like mathematical axioms, they gain nothing from attempted translation into concrete terms.

In a homogeneous group a majority of all individuals may alike respond to varied stimuli, and the stimuli are not necessarily powerful. The co-operation of such individuals is spontaneous. Their organization may be democratic in form and spirit.

In a homogeneous group the like responses of many individuals to the same stimulus are not greatly unequal in degree. Consequently, there is no sharp division of the group into two classes, composed respectively of those persons that have initiative, and those that merely assent: the classes, namely, of the leaders and the followers. Any individual may at one time suggest and lead, at another time yield assent.

In the homogeneous group there is a substantial

equality of energy and ability, and, consequently, but little transformation of the weak by the strong. There is no exploitation.

Therefore, in the homogeneous group there is a strong and inclusive consciousness of kind.

In the heterogeneous group a majority of all individuals can respond in like ways to comparatively few stimuli, and these must be powerful.

In the heterogeneous group more individuals are alike in instincts and in motor impulses than in sympathies, and more are alike in sympathies than in intelligence. In this group, therefore, more individuals can alike respond to stimuli that appeal to motor impulse, or to feeling, than to stimuli that appeal to intelligence. The stimuli that most powerfully appeal to motor impulse are danger and menace. Among those that appeal to instinct and feeling both, are bribe, gift, patronage and payment; while the stimulus that most strongly appeals to feeling only, or to states of mind in which feeling is predominant, is the impressive power of a strong personality.

In the heterogeneous group there is inequality of energy and of ability. Responses to any given stimulus, therefore, even when otherwise alike, are unequal in degree. Certain individuals take the initiative, and others accept their guidance. The population is differentiated into leaders and followers.

In the population so differentiated there is an equilibration of human energies that becomes a transformation of the weak by the strong. It may take the form of subjugation, or of exploitation. This happens not only in the relations of differing races to one another, but also throughout the social system,—in ecclesiastical

organization to the advantage of the priesthood, in industrial organization to the advantage of the entrepreneur or the walking delegate, in political organization to the advantage of the boss and his henchmen.

In the mentally heterogeneous population there is either no general consciousness of kind, or it is weak. If the population is compound there may be a strong consciousness of race or class differences.

From the foregoing principles it follows that a population that is heterogeneous in blood, ideas and interests to an extreme degree cannot spontaneously combine its efforts in co-operative undertakings. It acts collectively only in response to some extraordinary stimulus, or to one that appeals only to the relatively low instincts. Fear of the torture, imprisonment, or death that a conqueror may inflict, may be the only stimulus to which all of the extremely diverse elements of a compound population can respond, and the resulting social organization is then despotic. When, however, a large measure of assimilation has been achieved, it is possible for elements still diverse, though not in an extreme degree, to respond to other stimuli than danger, and to establish systems of organization that, while still monarchial or oligarchical in form, are not despotic in character. The governing power may offer benefits that strongly appeal to the masses governed, or it may have acquired a religious sanctity that impresses,—that derives strength from associated stimuli of belief and dogma. The chief stimulus, however, that under the circumstances assumed is efficient in achieving organized co-operation, is the impressive power of a strong personality. The government evolved may be dignified as "Cæsarism," or irreverently described as "boss rule," but it is all one in essence. Generalizing, we may say

that the heterogeneous community is normally autocratic, or oligarchical in organization. If the leaders can inspire fear, their rule is despotic. If they can inspire veneration, their rule is authoritative. If they can inspire admiration and confidence and confer favors, their power is the rule of "the boss." Historically, the co-operation that has in it a large element of coercion, is likely to be the first one to arise in such a mixed population as results from migration, or the colonizing of a new land. This stage is likely to be followed by one of oligarchic or of personal rule. Very slowly and very late in the history of any people or organization does it become thoroughly democratic in spirit and in form.

Nevertheless, from the moment when the assimilation of miscellaneous elements begins, there is likely to be an evolution of an entirely new order of stimuli, far higher in character than the primitive stimuli of danger, menace and bribe; higher even than the stimulus of strong personality; and yet, like these, powerful enough to awaken the responses of differing natures. These new and higher stimuli are ideals, and it is these that presently become a factor of chief importance in the higher forms of social causation. It is through responsiveness to ideals that it becomes possible for a people to combine three somewhat antagonistic conditions in their social evolution, namely: first, cohesion, which, in the last analysis, is a continuing agreement of response to common stimuli; secondly, variation and progress, which are possible only when the individual units making up a population are not too much alike; and thirdly, increasing freedom of individual life, which is possible only when cohesion can be maintained in the absence

of coercive stimuli, and notwithstanding the divergencies inherent in individual differentiation.

Social ideals arise in the minds of exceptional individuals who perceive that their conceptions of their fellow men, like their ideas of the external world in general, fall into intellectual arrangements or combinations that differ from objective arrangements in the world of reality. Among such combinations are some that seem to the minds that make them preferable to the combinations existing in fact. These mental complexes become ideals of a social order that appeals to imagination and desire. Communicated by their creators to their fellow men they oftentimes have the power to call forth persistent effort to transform the external order of things into a realization of the ideal. All history is full of examples of men mentally unlike in most respects, but alike in their interest in a common social ideal. This is because the ideal is a highly composite stimulus appealing to motor impulse, to feeling and to imagination, as well as to reason. It happens, therefore, that men who could be organized only through the agency of a great personality, if the alternative stimuli were no more than ideas or plans that appealed to the intellect alone, can sometimes be organized by a great ideal, even more successfully than by authority, or by the boss.

With these principles and possibilities before us, we now ask how they are combined in the historical process, inquiring, as we proceed, how ideals emerge, and how they transform the coercive and authoritative modes of co-operation into the liberal and the democratic.

For the purposes of this paper I shall restrict myself to a consideration of three great social ideals; those, of unity, of liberty, and of equality.

Again we turn our attention to the composition of the population, for herein are to be discovered the conditions that determine the evolution of ideals and the great stages of historical process.

A social group of any kind or dimension, let it be, if you please, a trade union, a township, or a nation, may be conceived as having so many elements of unity that it is easy for individuals that agree in their thoughts and purposes to have their own way with such of their fellows as differ from the prevailing type. Such a mass of agreements entering into a collective will, is the fact of collective sovereignty in its most general psychological aspect. In any community where the power and the wish of some section of the population to rule has been developed, differences and disagreements excite antagonism, distrust and anxiety. It is perceived that there is strength in unity, and the passion to make all men within the community more alike begins to be consciously felt, and to make itself a power. The ideal of unity is carefully formulated, and is persistently kept before the minds of all members of the group. If the group is a voluntary organization, like a religious denomination, a trade union, or a political party, an attempt is made to persuade or to compel all its members to believe the same things, and to conduct themselves in like ways. A creed, a body of rules or a platform is imposed, and orthodoxy or regularity is insisted upon as of primary obligation. If the society is a nation, attention is fixed upon other modes of unity also. The territory itself that the people occupies becomes an object of new interest. Adjoining geographical areas, that by reason of topographical features naturally belong with the domain already possessed are covetously regarded, and the attempt is made to

conquer or otherwise to annex them. Adjacent populations having like interests and traditions, related in blood, and speaking allied languages, are viewed as properly belonging to the community that would absorb and dominate them. Within the population itself the amalgamation of bloods is watched with interest, and the process of mental assimilation with yet more concern. Policies are adopted to hasten on the change. One language must be spoken throughout the whole domain. One religious faith must be embraced by all. One consistent economic policy must be followed. One standard of conduct and of legality must be established for all citizens. These policies are a part of the great nation-making plan of unification. If successful, the passion for homogeneity seizes upon the whole population. An ideal that has at first taken possession of the ruling classes, has gradually awakened the enthusiasm of a people. The ideal itself has been suggested by changes quite unconsciously originating. Amalgamation and assimilation necessarily forecast the kind of community that must exist if they go on to completion. Co-operating with this suggestion is a consciousness of the exceeding difficulty of maintaining social cohesion where great differences of blood and interest exist.

Thus it is the composition of a population under circumstances of diminishing heterogeneity that gives rise to the first great ideal—that of unity.

Perfect unification, complete homogeneity, would inhibit further progress; but the perfect unification of an arrested civilization is rarely attained. So long as there remain in the population many diverse elements freely communicating with one another, and still undergoing assimilation, the conditions are present for progress. No scheme of unification ever quite destroys the restless

individualism of the rational mind. Unifying policies, involving as they do a large measure of coercion, much repression of individual initiative, and much thwarting of ambition, goad the more rebellious spirits into open opposition, which can be repressed only if all heretics and disturbers of the political peace can be exterminated. At the same time, by putting an end to many conflicts between independent states that have at length been brought into an inclusive national or imperial organization, the unifying policy releases energy to expend itself in commercial enterprise, in public agitation, in destructive criticism and perhaps in overt rebellion. Under these circumstances the stimulus of authority begins to lose its power, and the ideal of unity ceases to impress the imagination with the old time vividness. New ideas take shape in an ideal of liberty, which appeals with increasing force to men of every blood, of every degree of culture and of economic condition. The broadening response to this new stimulus in time creates the great policies of liberty, including the establishment and protection of individual liberty by forms of constitutional law.

But just as the policy of unification when pressed too far creates reactions against itself, so also does a régime of unlimited liberty. It creates conditions of great and increasing inequality. The energetic and the enterprising, unrestrained in their activity, acquire control of the machinery of government, of the administration of law, and of economic opportunities. Enjoying perfect freedom of contract, they organize the industrial system to secure the utmost increase of wealth and its utmost monopolization. Having through liberty obtained power, they proceed by all possible means to monopolize liberty itself, taking care to maintain those

legal forms of freedom that protect property and enterprise, and that encourage competition among wage-earning laborers, while more than willing to restrict competition among themselves. An increasing density of population intensifies the struggle for existence. Class differentiation is hastened, and presently social cohesion is threatened through the exploitation of the weak by the strong. From the exploited comes the demand for wider opportunity and a larger share in material prosperity. It is perceived by the intelligent that if a disruption of the community through a revolt of the discontented, or a general revolution, is to be prevented, some limitation of the liberty of the strong to curtail the liberties of the weak must be imposed, and that practically this means a certain limitation of liberty by equality. It is under these circumstances that the ideal of equality arises, and that its influence over the multitude creates the democratic movement, as that term is understood in modern times.

Certain conditions, however, must be fulfilled before this ideal can be converted into reality. We have seen that democracy is possible and normal in a homogeneous population. It is possible also in a population that is otherwise heterogeneous, if there is a practically universal belief in the superiority of democratic forms; if the democratic ideal is a strongly dominant stimulus, calling forth the habitual response of nearly all men. Under these conditions there can be democracy, at least to the extent of majority rule.

Democracy, however, is not necessarily more liberal than monarchy or oligarchy. In recent years we are witnessing abundant proofs that in its denial of the liberty of the individual a majority may be as despotic as an Italian tyrant, or a Turkish sultan. Democracy

can be of the liberal sort under any one of three possible conditions. The first exists when the people are homogeneous and equal. Co-operation then is spontaneous, and democracy is the normal form of organization. The second exists when an entire people, though otherwise heterogeneous, cherishes the ideal of liberty, and is sensitively responsive to it. The third exists when extreme inequalities of condition are being modified by an equilibration of energies in which the strong, instead of exploiting the weak, are succeeding through policies of helpfulness and justice, and by education, in developing and lifting them up to a higher plane of social efficiency.

Passing over the two conditions first named, we may profitably linger for a moment upon the process of equilibration through education and justice. It begins when society has become complex enough to pass from policies of unification to those of liberalism and democracy. It is a common error of popular sociological thinking to conceive of philanthropic activities as a conscious combating of that order of nature which has its sources in physical phenomena, and which assumes in the organic world the form of the struggle for existence. In reality the philanthropic process is inevitable, and happily, here and there a student of social evolution is beginning to apprehend its nature and causation.

Mr. Benjamin Kidd, for example, has attempted to prove that all real progress has its cause in a fact that he calls projected efficiency. Those organisms and those institutions survive, he tells us, that have potential qualities that will be realized in future race development. Mr. Kidd has in this hypothesis taken hold of a great truth, but I think that he has not stated it in

the clearest and most accurate way. We cannot say that an organism survives because of qualities or peculiarities of structure that would give it an advantage in another environment, or at some future time. It does not maintain itself in the struggle of the here and now because it has potentialities that will enable its offspring to survive in the terrestrial elsewhere and hereafter. Nevertheless, it is an elementary truth that certain organisms develop surplus energy, and that surplus energy sometimes enables them to survive under circumstances that would bring death to creatures less generously endowed. Now it is these organisms endowed with surplus energy that transmit to posterity a rich legacy of ability, or, in certain instances, convey to fellow-creatures of their own generation a freely given help. Of all the higher organisms, and especially of all successful individuals in human society, it must be said that any advantage that they enjoy they owe to an efficiency that was transmitted to them by their ancestry, or freely made over to them by contemporaries endowed with surplus energy that has been expended in socially helpful ways. Of all the modes of socially distributed surplus energy, the most important are sympathy and its allied elements in the consciousness of kind. Given this force, the transformation of the weak by the strong necessarily becomes to some extent an uplifting, instead of an exploitation. Given the equilibration of energy through uplifting, there is a necessary growth of equality, and an increasing possibility of successful democracy of the liberal type.

In communities of each type that has now been described there are characteristic social bonds. They are products of all the factors to which we have given con-

sideration, namely: the character of the environment, the size and composition of the population, and its degree of homogeneity, the dominant stimuli to which it responds, and the form of its co-operation.

In the small and isolated population, ethnically and mentally homogeneous, there is a strong consciousness of kind, and the community is held together largely by acts of imitation and of kindness.

In the small and heterogeneous community occupying some especially favored spot within a larger national domain, as for example, a rich metalliferous tract to which men that were strangers to one another have come in pursuit of material well-being, the sympathetic element of the consciousness of kind, and other bonds that hold the kindred folk together, are relatively unimportant. Through conflict between man and man a general condition of toleration is brought about, and a bond of spontaneous justice is gradually supplemented by good will and neighborly helpfulness. In such a community there is also spontaneous allegiance to daring leadership; and a more or less contagious emotion may at times become a powerful social bond.

In the compound population created by invasions and conquests, the power of the conquerors to inspire fear or reverence, and the obedience or loyalty of the conquered, are the chief social bonds. These are permanent, however, only if the character of the country, the economic opportunities, and the opportunities for adventure, are not such as to lead to a dispersion of the conquerors and a disintegration of their own social cohesion, as happened throughout large parts of the Roman Empire, and especially in France, along the Rhine, and in northern Italy after the barbarian invasions. When such dispersion occurs the political chaos and incessant petty con-

flict that follow result in the creation of bonds of intrigue and conspiracy. When, however, conflict has been carried far enough to eliminate elements excessively unlike and unequal, conspiracy gives place to relations of contract. In the political system a merely political sovereignty is developed into a legal sovereignty. Finally, when through assimilation a complex and highly differentiated population has become so far homogeneous in mental constitution and in culture that common ideals are cherished, especially ideals of liberty and of enlightenment, the chief social bonds may consist in patriotism, fidelity, honesty, and unselfish social service.

Each type of community gives rise to a certain type of social theory, and herein we have a final and especially interesting disclosure of the relation of environment to the intellectual processes when the phenomena collectively are looked upon as groupings of stimuli and response.

The kindred community, living in an isolated environment, can have only natural genesis theories of social origin. The community is pictured—as in the creation myths of our North American Indians—as sprung from a totemistic and matriarchal ancestry; or—as in the social traditions of the Semitic and Aryan stocks—as descended from a patriarchal family. In such communities also, the only conception of the psychological ground of the social relation itself that can be entertained is some form of the idea of natural brotherhood, a primitive germ of the notion that may afterwards be developed into the so-called sympathy theories of society.

In the simple and homogeneous communities that are sometimes brought together by congregation when the economic opportunity attracts men of one kind only, as

for example, fisher folk, or woodsmen, or farmers, there can arise only those consciousness of kind theories that are reflected in the proverb, "birds of a feather flock together," and natural justice theories of an elementary sort.

In the heterogeneous society that is formed by a congregation of miscellaneous elements alike in little except a bold and adventurous disposition—such a society as was seen along the Ohio and the Mississippi rivers in the days of the voyagers and flat-boatmen, or, at a later time among the ranchmen of the great plains—where kinship ties count for nothing, and one man is as good as another, the only social philosophy possible is the brutal theory, uncritically accepted, that might makes right; but when, later on, conflict has established an equilibrium of strength, and toleration emerges, the philosophy of might slowly gives place to theories of natural justice.

Where a wide and bountiful environment has been conquered by invaders, and the invaded are being reduced to subjection under the hammering of a compact invading host, the only native theories of social causation are those of race or class conflict, and of political sovereignty. If, subsequently, the invaders disperse, and as a class become disintegrated, as the Normans did in the days of Stephen, and as the Lombard invaders of Italy did, and a struggle of every group for itself, or even of every man for himself within the group, supervenes, until intrigue and conspiracy, such as prevailed in the decaying years of the feudal régime, reduce society literally to that state of nature that was described by Hobbes, no other social theory can be conceived than that one which was set forth by Machiavelli in the pages of "The Prince." When,

however, out of such chaos a new social order emerges through an elimination of excessively antagonistic elements, the way is prepared for a broader understanding and agreement. It is then that contract theories and legal sovereignty theories arise to explain the new condition.

And at last, when the inhabitants of a compact state or of a great nation have undergone much assimilation, and their consciousness of kind has become both moral confidence and a comprehension of mind by mind, and when the ruder social bonds of obedience and justice have been transmuted into fidelity, honor and social service, there can arise a great variety of complicated explanations of so complex a social system. They may include evolutionist theories, psychological theories, developed forms of the contract theory, and, above all, idealistic theories expressive of the possibility of remodelling society in accordance with some Utopian plan. It was after the age of Pericles that Plato dreamed "The Republic," and in the Macedonian empire that Aristotle created "The Politics."

A THEORY OF SOCIAL CAUSATION
DISCUSSION

ALBION W. SMALL: The substance of what the sociologists are likely to say about the present argument will be in the way of ratification and emphasis. The paper is a masterly survey of the whole field of sociology with the exception of its teleological section. Its main divisions are, first, an introductory account of the function of sociology; second, proposal of a primary working hypothesis—like response to stimulus; third, proposal of a secondary working hypothesis concerning the physical side of social causation, namely, the effect of environment upon the composition of the population; and fourth, suggestions of a programme for interpreting the psychical side of social causation. The paper is in many ways an advance movement in sociological thinking. It seems to me to justify its author's tentative claim. It deserves to exert the constructive influence which I predict that it will have on American thought in our field.

Having the paper as a whole in mind for illustration, rather than specific points in its contents, I will confine myself to a few generalities. A decade ago at a meeting of the American Economic Association in New York, one of our most respected economists frankly declared that, if he could have his way, no sociologist would ever be admitted to a university faculty without permission of the economists. Meanwhile, some of us have found the monotony of life not a little relieved by watching the process by which this genial dogmatist has triturated himself boldly into a most extreme form

of sociology. I want to go on record with the prediction that, in the lifetime of children already born, it will become impossible for anyone to be appointed to the humanities division of the faculty of any first-rate university or college, unless he can creditably sustain an examination in general sociology. I further predict that men of my own age will live to use such terms as ethnologist, historian, economist, politicial scientist, sociologist, without their present divisive and exclusive connotations.

We shall perceive that if we are thoroughly intelligent about our work, we find it to be concerned not with different material, but with different relations of the same material. We are not one of these specialists to the exclusion of the other. We are one of them primarily and provisionally, but the nearer we get to the real meaning of our material, the more are we all of them ultimately and essentially, in proportions that reflect the real connections of the relations we try to interpret.

The sociologists are actually reaching results that their colleagues in the other departments of human science cannot afford to neglect. These results are not yet to any considerable extent settled formulas of explanation. They are rather, as Professor Giddings has pointed out, apperceptive categories which mark greater or less removes of intelligence from naive conceptions in mere terms of time and space. To emphasize further what we mean by this, I may say it is simply an accident that sociologists have been supposed to be merely a sect of economic schismatics. On the contrary, the relations between the sociologists and the historians are much more fundamental and significant than those with the economists. The sociologist regards the economic

factor in the human process as only one strand in the cable of experience, while the task of the complete thinker is to run back all the strands, to explain their sources and how they are woven together, with the use of the whole after it is woven. Now it may be said that with the rise of the Austrian school economic theory virtually came into line with the method demanded by the sociologist. Carl Menger told me last summer that in his opinion the phrase "Austrian school" has no longer anything but a purely historical meaning. "All that I ever contended for," he said, "has virtually been assimilated by every progressive economist, and there is no longer any reason for distinctions on that line." The Austrian school really fought the decisive battle for the psychological factor among economic forces. The economic element in experience thus takes its place with all the other elements to which the psychologic interpretation is applicable.

But with the historians the case is different. Even with your permission, I might not dare to express myself fully if what I want to say had not virtually been anticipated by the president of the Historical Association in his address at Philadelphia last year. He would probably regard it as a distinct grievance if it were intimated that he is a sociologist, but there are signs that he could qualify for the guild. I am also informed that the same thing is evidently true of the president of the Historical Association this year, as shown by the paper read at the opening session of this meeting.

In the first place, the historians do not seem to be agreed that their function involves any interpretation at all. To be sure, it is historical hearsay that all modern historical writing is from the "social point of

view." Nevertheless, from the sociological standpoint, it is a constant question whether the historians have so much as heard that there be any social point of view. The social point of view is that every event in human life, whether the actors get a glimpse of its meaning or not, is really a part of a co-operative process, in which each detail has a meaning that comes from its connection with the whole. This viewing the incident, whatever it is, as a partial expression of the whole, with consequent discovery of the whole in the incident, and of the incident in the whole—this is the essence of the social point of view. Men who write history from any other outlook are simply newspaper reporters whose items are out of date.

But, beyond this fundamental difference, the quarrel of the sociologists with the historians is that the latter have learned so much about how to do it that they have forgotten what to do. They have become so skilled in finding facts that they have no use for the truths that would make the facts worth finding. They have exhausted their magnificent technique in discovering things that are not worth knowing when they get through with them. These discoveries may be taken up by somebody else and brought into their meaning relations, but history, as it is mostly written to-day, does not come within sight of those relations. The historians are locating cinders on the face of the glacier, but they overlook the mountain ranges that carry the glacier.

When we once start to study human affairs, there is no stopping place, on any other ground than confession of mental incompetence, till we reach answers to these questions:—What are the essentials in human relations? In what varieties do these essentials appear

under different circumstances? How do we account for these universals and their accidents? What pointers does this knowledge give us about our own conduct?

In other words, we have not covered the first stage of social self-knowledge until we have summed up historical experience in terms of the perpetual rhythm of development, accommodation, and satisfaction of human interests; or, as Professor Giddings prefers to say, in terms of stimulus and response. The sociologists can do little toward this interpretation, that is, their perspective and range of induction would be viciously incomplete, without calling on the historians; but the historians' results are abortions if their growth is cut off before they pass into the stage of sociological generalization.

Referring now to certain details of Professor Giddings' argument, I would say that all possible difference of opinion among sociologists about its spirit and the strength of its main contention is a negligible quantity. His positions would have to be much less important than they are, however, if they could be accepted without reserve. In my own opinion, his primary hypothesis—"like response to stimulus" or "consciousness of kind"—is inferior in importance to his secondary hypothesis of the effect of environment upon population. The former seems to me much less ultimate and much less fruitful than to Professor Giddings. I am bound to confess, however, that other sociologists have taken up his idea and have agreed with his estimate rather than mine. To tell the truth I am sometimes worried by a suspicion that in my mental makeup there is some sort of a plagiaristic parasite that leads me to think an idea has always been familiar after someone has made it

plain. Perhaps that may account for my position in this instance, but since Professor Giddings first suggested this primary formula it has seemed to me that it either meant something which we had virtually taken for granted, and which we might accept without debate, or that it meant something more which would not prove to confirm its author's estimate.

Sociologists have not yet straightened out their ideas about popular misconceptions of physical science. We assume that something has been done which has not, and we are ambitious to duplicate that triumph in social science. We want to find the one "force" or the one "principle" that accounts for social history, just as we suppose the force of "evolution" or the principle of "natural selection" accounts for physical history. But in the sense in which we use the word, evolution is not a "force," it is a method, and an infinitely undiscovered method at that. "Natural selection" is not a "principle," it is a process, and the biologists to whom I go for information instruct me that they are just beginning to make out the rudiments of the process. What Lamarck, Darwin and Wallace generalized, and what Spencer phrased, is really the problem itself, not its solution. The scientists who are working on the philosophical frontier are busy in their approaches to the solution of the problem which these pioneers most successfully stated. Now, if Professor Giddings' generalization "like response to stimulus" or "consciousness of kind" carries any of this idea, that it identifies a force or principle that moves the world, I am unable to see the formula in that light. If, on the other hand, the phrases are merely convenient generalizations of the problems which Professor Giddings brilliantly attacks with this secondary hypothesis, and then with his

psychological propositions, they serve a purpose, yet hardly of the capital order which their place in the argument must be understood to imply.

Before closing, I would express my admiration for the insight displayed in the third and fourth divisions of Professor Giddings' paper. I believe he has there reached some cardinal contributions to sociology. I cannot refrain from pointing out once more in this connection, however, that there is a vast void, which nothing but a new order of historical work can fill, between our present ignorance of actual social reactions and confirmation of such theories as Professor Giddings has proposed. We need to know, in the concrete, just how human interests have combined with each other in every variety of circumstance within human experience. There has never, to my knowledge, been a fairly successful attempt to schedule efficient human interests in general, till Ratzenhofer did it less than ten years ago in *Das Wesen und Zweck der Politik*. With this work sociology attained its majority. Henceforth all study of human relations must be rated as provincial, which calculates problems of life with reference to a less comprehensive scheme of interests than his analysis exhibits.

The sociologists are settling down to as strict and positive analysis of the sort of thing that takes place in human reactions as the chemists have carried on in their sphere. Men in other divisions of labor within the social sciences cannot afford to leave the sociologist out of the account. Professor Giddings' position is impregnable, that we have something to say to each other, and that each of us needs the other's help for the completion of his knowledge.

CHARLES HORTON COOLEY: In discussing this notable paper I wish to confine myself to only one of the fundamental questions upon which it touches, namely, that of the nature of history as regards cause and effect; and my aim will be to distinguish three ways of thinking about it; first, the materialistic, second, the idealistic, third, what I would call the organic. In the preference I shall avow for the last, I hope that the distinguished author of the paper will, on the whole, agree with me, though I am not sure that he does not, here and there, show a certain leaning toward the first.

The materialistic view assumes that physical conditions are in some sense original and ultimate causes of the movements of history; that they are primary, as compared, at least, with such complex products of the mind as institutions and social ideals, which are held to be secondary or derivative, though perhaps of equal immediate importance. The best-known representative of this way of thinking is Herbert Spencer, whose whole philosophy assumes the primacy of material facts and aims to show how mental and social facts grow out them.

The primacy claimed for material elements must, I suppose, be a primacy either in time or in logic. As to time, I am unable to see from what I have learned of history and anthropology, that the physical aspect of life came before institutions and ideals, or was, generally speaking, of relatively greater importance in the past than at present. No doubt institutions and ideals have greatly developed, but no more, perhaps, than have economic activities. To me these seem to be co-ordinate phases of existence which have ever marched side by side. When I look back through the past I seem to see

human nature, language, institutions, modes of conflict, modes of getting a living, philosophies and aspirations, ever as one indivisible life, even as they are at present; although certainly the whole and every phase of it becomes cruder as we go back. We have learned from the works of Professor Giddings that we can no longer regard human nature as separable from language and other institutions; the individual no more created these things than they created him, all is one growth. Even poetry is, in a sense, as old as man himself; for language is truly said to be fossil poetry, and language and human nature, we now believe, arose together.

But have not the economic activities at least a primacy in logic, as being the necessary basis of every thing else?

I cannot see that the getting of food, or whatever else the economic activities may be defined to be, is any more the logical basis of existence than the ideal activities. It is true that there could be no ideas and institutious without a food-supply; but no more could we get food if we did not have ideas and institutions. All work together, and each of the principal functions is essential to every other.

I am not sure that the feeling of the primacy of material conditions has any better foundation than their tangible and visible character which makes them stand out more clearly before the mind and gives an illusion of their independence. As they exist in society, or for us, they are really as plastic and changeable as thought itself. Social and psychological science is, in my opinion far too complaisant to that prejudice of the physical scientist which identifies the ideal with the vague, and wishes to have as little to do with it as possible.

I do not object to the interpretation of history from the materialistic point of view, so long as it is recognized that this is partial, deserving no logical preference over the idealistic point of view, and always needing to be balanced by the latter. But, so far as I have noticed, writers who start from material data are inclined to hold not merely that this is *a* place to start but that it is *the* place; and, if so, I think they are justly chargeable with materialism.

I do not quite agree with the paper in the view that materialistic interpretations fail to satisfy us only because they have not explained the ideal. I should not be content with seeing how the ideal proceeds from the material, but I should wish also to begin at the other end and see how the material, as it exists in society, proceeds from the ideal. The industrial society of the nineteenth century for instance, is perhaps as much the result of the institutions and philosophies of the eighteenth as it is a cause of those which are to be in the twentieth. And, finally I should wish to unite these partial views so far as possible into a total or organic view, a perception of the living fact.

I will not dwell upon the merely idealistic view of history, since it has little vogue at the present time. It has as much one-sidedness as the other. Looking upon thought as the causal force in all life it treats things as no more than its symbols.

I would not, however, conceal my opinion that it is quite as plausible and legitimate, quite as scientific, if you please, to treat the human mind itself as the primary factor in life, and history as its gradual unfoldment, as it is to begin with the material. Why should the stimulus or spur of progress be ascribed to things more than to the mind itself?

The organic view of history denies that any factor or factors are more ultimate than others. Indeed it denies that the so-called factors—such as the mind, the various institutions, the physical environment, and so on—have any real existence apart from a total life in which all share in the same way that the members of the body share in the life of the animal organism. It looks upon mind and matter, soil, climate, flora, fauna, thought, language and institutions as aspects of a single rounded whole, one total growth. We may concentrate attention upon some one of these things, but this concentration should never go so far as to overlook the subordination of each to the whole, or to conceive one as precedent to others.

One who holds this view is not content to inquire whether the economic interpretation of history is the fundamental one. Back of that, he thinks, is the question whether there is, in fact, such a thing as a fundamental interpretation of history, in the sense that one aspect of society is in its nature more ultimate than others; whether life actually proceeds in a one-two-three manner, and not, rather, in a total manner, each special phase of it at any given time being derived not merely from some other special phase but from the total condition of mankind in the preceding epoch. He believes that life, go back as far as you will, is a progressive transformation of a whole, in which the ideal, institutional and material phases are co-ordinate and inseparable.

History is not like a tangled skein which you may straighten out by getting hold of the right end and following it with sufficient persistence. It has no straightness, no merely lineal continuity, in its nature. It is a

living thing, to be known by sharing its life, very much as you know a person.

In the organic world—that is to say in real life—each function is a center from which causes radiate and to which they converge; all is alike cause and effect; there is no logical primacy, no independent variable, no place where the thread begins. As in the fable of the belly and the members, each is dependent upon all the others You must see the whole or you do not truly see anything.

Supposing that this organic conception is a just one, what practical bearing, let us ask in conclusion, has it upon the method of expounding or of comprehending history?

It by no means discredits the study of history from particular points of view, such as the economic, the political, the military, the religious. The whole is so vast that to get any hold of it we need to approach it now from one point of view, now from another, fixing our attention upon each phase in turn, as all the world did, a few years ago, upon the influence of sea-power when Captain Mahan's work appeared. But no study of a special chain of causes can be more than an incident in that perception of a reciprocating whole which I take to be our true aim.

If we think in this way we shall approach the comprehension of a period of history very much as we approach a great work of organic art, like a gothic cathedral. We view the cathedral from many points and at our leisure, now the front and now the apse, now taking in the whole from a distance, now lingering near at hand over the details, living with it, if we can, for months; until gradually there arises a conception of it

which is confined to no one aspect but is, so far as the limits of our mind permit, the image of the whole in all its unity and richness. And it is such a view as this at which we aim in the study of history. Every competent student may help us, whether his work is narrative or philosophical, large or minute, written from one point of view or several; but after all what we would like to get is nothing less than a living familiarity with the past, so that in the measure of our faculty, we might actually possess it in something of the various unity of life itself.

LESTER F. WARD: The time allowed for discussion seems to require its restriction to some one salient point in Professor Giddings' comprehensive paper. The strongest point he makes, as it seems to me, is that in which he treats the three stages in the development of a people, and which he correctly designates as those of unity, liberty, and equality respectively. These three stages may, however, with equal propriety be designated as so many different steps in the attainment of human freedom. The stage of unity may be called that of national freedom, the stage of liberty that of political freedom, and the stage of equality that of social freedom.

The first and prime requisite during the early efforts at nation forming, following upon 'conquest and subjugation, is the consolidation of the amalgamating group into a national unit capable of withstanding the encroachments and attacks of other outside groups. Until this is attained none of the subsequent steps can be taken. But it involves the elaboration of the crude and antagonistic materials into the only kind of order or organization of which they are capable, viz., the politico-military organization. The sali-

ent features of such an organization, are extreme inequality, caste, slavery, and stern military domination. It is during this stage that the individual system is sketched on the broad lines of social cleavage, resulting in the three great fundamental social tissues, the ruling class or ectoderm, the proletarist or entoderm, and the business class or mesoderm of the primitive state. They form a strong bulwark and enable the inchoate state to defend itself against hostile elements from without during the subsequent stages in social assimilation. They secure the first great prerequisite—national freedom.

But individual liberty is at its minimum. The conquered race, which always far outnumbers all other elements, is chiefly in bondage, and the great struggle for political liberty begins. Ultimately, as the history of the world shows, this is in large measured attained. Throughout antiquity, the Middle Ages, and down to the middle of the nineteenth century, this was the great, all-absorbing issue—political freedom. One after another the bulwarks of oppression—slavery, serfdom, feudalism, despotism, monarchy in its true sense, nobility and priestly rule—fell, the middle or business class (*bourgeoisie*) gained the ascendant, which it still holds, and political liberty was attained.

So all-important did this issue seem that throughout the eighteenth century and down to near our own time it was confidently believed that, with the overthrow of political oppression and the attainment of political freedom, the world would enter upon the great millennium of universal prosperity, welfare, and happiness.

But, as Professor Giddings has shown, this was far from the case. As sages predicted, events have proved that there remains another step to be taken. Another

stage must be reached before any considerable degree of the hopes that were entertained can be realized. Professor Giddings calls this the stage of *equality*. I prefer to designate it as the stage of *social freedom*. The world is to-day in the throes of this great third struggle. Military oppression and royal oppression have been abolished. Slavery, serfdom, feudalism, have disappeared. Autocracy and aristocracy no longer rule. The power of royalty, of the priesthood, of the nobility, has been broken. The civilized world is democratic, no matter by what name its governments are called. The people rule themselves by their sovereign votes. And yet, never in the history of the world was there manifested greater unrest or greater dissatisfaction with the state of things that exists to-day. National freedom and political freedom have been achieved. Social freedom remains to be achieved. The race struggle and the political struggle are practically over and we are in the midst of the industrial struggle. The military power, the sacerdotal power, and the power of the nobility have given way to the economic power or the power of wealth. This last is now being challenged by the industrial power or the power of labor. The first and second estates have surrendered their scepter to the third estate, which is as nearly "everything" as the Abbé Seyès could have desired. The ominous rumbling that we now hear in the lower strata of the social world is due to the coming to consciousness of the fourth estate. The social strata that consisted first of slaves and serfs and then of peasants and laborers, now embrace the voters of democratic states. It would be well if historians would turn aside for a time from the study of military and political events

and begin the study of the most important of all human events, the rise of the proletariat.

I have in these few words sought merely to state the problem, not to solve it. History will solve it as it solves all problems, and while it would be presumptious of any one to venture a prediction, the history of the past seems at least to establish one principle, which is that the entire movement I have sketched is one movement, and that its direction is ever the same and irreversible.

GEORGE L. BURR: I have listened with much interest to the speculations of Professor Giddings. But, if you ask me as a student of history for a verdict upon them, I can only make the plea which I think the lawyers call "confession and avoidance". They are very fine. They may well be very true. But the thing of which Professor Giddings is talking is not history.

The law of language is use. Words, like people, have their vested rights. And history is an ancient word. From Herodotus to Mommsen it has had a recognized meaning. I am not so rash as to hazard here a definition: it is not needed. The very grievance of Professor Giddings is that the word has never meant what he would now make it mean. Supported by his charges, I may at least dare to admit that the theme of history *has* been the lives and deeds of individuals—individual men, individual peoples, individual states, individual civilizations,—that its method has been, not biologic, but biographic,—and that its prime aim, however obscured now and then by the prepossessions, theologic or sociologic, of a historian, has always been, in the simple phrase of Ranke, to learn and to tell "*wie es eigentlich gewesen ist*"—how it actually was.

But, says Professor Giddings, this is not a science. I do not know. I do not greatly care. It is not the sciences alone which have a right to their names and to their fields. There are the literatures and the arts. Science is, after all, but an old Latin word for knowledge; and I gladly grant that knowledge is not the highest aim of history. It is no historical sentimentalist, no mere quibbling pedagogue, but the great constitutional historian of England, who holds the chief worth of history to lie, not in the knowledge it gives, not even in its training of the imagination, the sympathy, the insight, the judgment, but in the growth it brings to him who studies it for its own sake. It is travel, acquaintance, experience, life. History *is* society. Where else will the sociologist find that past with which he deals? Even of yesterday he knows only through the newspaper; and the newspaper is history.

Yet is it so sure that history is not a science? It is, indeed, not a natural science. In the days of Pythagoras nothing could be a science which could not be reduced to terms of mathematics. In the Middle Ages all science was forced to be metaphysical. Only the syllogism was proof. To-day it is the turn of the natural sciences.

> "I am the Master of this College,
> What I know not is not knowledge."

To Professor Giddings, history, without classification and induction, is but "a chaos of unassorted facts." It must be developed like descriptive botany and comparative anatomy, and so made "a true explanatory science."

Yet even President Seligman allows us the alternative of being "a method." Is it quite sure, while as yet we have no admitted classification of the sciences, that a

method is not the adequate criterion of a science? And is it wholly clear that we have no field of our own, we who neither deduce nor generalize? When, in the process of nature, there came into existence the phenomena of organic life, there was born a need for something other than the physical sciences. There was nothing, even now, which physics might not weigh and chemistry analyze; but to the sympathetic understanding of the subtle processes of life there was a nearer and less clumsy way, and the biological sciences were born—botany and zoology, morphology and physiology. So, too, at a later stage, there come into view yet other phenomena,—the phenomena of personal consciousness and choice; and, not because of any break in the order of nature, but merely because of the accident that we ourselves are men and women, endowed with consciousness and choice, there is open to us a door for the immediate understanding of these conscious, choiceful acts. They need for us neither demonstration nor explanation: we see and we understand. The method of history, says Droysen, is "*forschend zu verstehen.*"

Why, even the philosophers, who were wont so loftily to lay down the law for the sciences, have at last bethought them to notice what history is, as well as what it ought to be. The experimental psychologists themselves, who seemed about to surrender to natural science the very stronghold of metaphysics, have come to our help. A Dilthey has shown why history must forever deal with the individual and the concrete, and must rest on biography as the social sciences do on anthropology. A Simmel has made it clear that the knowledge we gain of other men and other ages by living ourselves into their lives is a real knowledge. A Wundt has shown the impossibility of historical laws,

and has pointed out that even when history uses the comparative method, it is not, as in the natural sciences, for induction and generalization, but only to find for a group of phenomena their explanation within themselves or in the familiar laws of human nature. A Rickert has found in history the science of reality, the necessary complement of the sciences of abstraction and generalization.

I would like to meet the argument that a method which individualizes must lose itself in a wilderness of details; but I must not overstep my time. Yet I can not close without protesting that the historian has no wish to do without the generalizing sciences. Politics, economics, ethics, are not history; but they are indispensable to history. The audacious generalizations of a Buckle were not useless because the new science which they helped give birth is now called, not history, but anthropo-geography. We are not the less grateful to a Taine because we must count much of his work folk-psychology. And even that ambitious comprehensive study, be it science or be it philosophy, which the Germans still call the philosophy of history, but which the followers of Auguste Comte in France and England and America prefer to know as sociology, may well have for us its own high use, if we can ever agree as to its province and its name.

But not less do these need history, and history as it is. History alone can teach them to find and to test their own materials. History alone can give them the atmosphere which permits their work.

Willis Mason West: On the train down from Chicago, and since our arrival in New Orleans, I have busied myself in collecting opinions of historians as

to what sociology is or ought to be. Of course, I have found no one who will accept as satisfactory the relationship between history and sociology set forth to-night by the sociologists. Indeed, I have found no one who believes that there can be a profitable sociology, as these gentlemen use the term;—no one who believes that there can be now a satisfactory philosophy of history and universal science of society. It is to be hoped that this will not disturb the sociologists any more than the sociologists' definitions of history disturb the historians.

If Professor Giddings' paper be representative of the sociologists' position, I do not despair of some slight progress even towards agreement, though it may be only agreement to let each other alone. The older sociologists have been somewhat too fond of implying that history for the most part is worthless, and that whatever of good there is in it may be found better in sociology. If we partially forgive these older writers, in consideration of the unscientific character of the older history, what shall we say of M. Taarde, who only the other day spoke flippantly of history as a "motley succession of fantastic paintings?" And what shall we say of those sociologists who have slipped into that tone in this discussion? Of course no headway is to be made in this way; historians are merely tempted to retort that sociologists can ill afford to fling these disagreeable missiles about so recklessly, until they move into less breakable and less transparent houses than those that have so far sheltered them.

Happily Professor Giddings is more just and more generous. He recognizes three stages in the study of past social events: a first stage where such events are arranged only according to chronology; a second stage where they are arranged according to likeness in func-

tion or structure; and a third stage, which he hopes *may be* attained, where they are "correlated with their underlying causes," so as to give a "rational, or explanatory arrangement." In the first stage, Professor Giddings calls this study history; in the second stage, he still calls it history; in the third stage he intends to call it—sociology! Now if this is merely a question of terminology, it does not matter; if, on the other hand, important practical consequences are to follow from the terminology, let us be clear as to what they are.

Professor Giddings recognizes that history has made "some progress" from the unsatisfactory chronological stage into the more scientific structural stage. It has advanced from the stage of the natural history of Buffon to the stage of the botany of Linnæus or the zoology of Cuvier. Very well! And when the Darwin comes, to organize history in a higher way, he may call it sociology if he wants to, but he must be a historian, as the Darwin of biology was a botanist and zoologist. The historians will acknowledge no terminology that conflicts with this fact; and for the present they deny the possibility of a Darwin for historical matter anyway. It is on these two points that Professor Giddings parts company with us.

Curiously enough, some have held the historians responsible for the division of the study of social life into wholly separate and reciprocally exclusive fields. This separation is just what the historians deny. It is our friends, the political scientists and the sociologists, who, coming late into the land, have built up their fences at will and warned the "mere historian" off their particular preserves; though, to be sure these gentlemen have a pleasant proneness to ignore their fences when they see anything they want on the historical side.

I trust I may be pardoned if I draw upon my personal experience for an illustration of this readiness to claim for other fields anything that the proprietors recognize as good in history. Some time since, I put forth a modest text-book in history. A friend of mine, who happens to be a professor of political science, speaks of the book to his classes, closing with the climax that Mr. West is not a "mere historian," but that he is really "something of a political scientist!" And then I have another friend who is a professor of political economy; this gentleman writes me delightful praise but adds that really I am, or ought to be, not a historian, but a political economist! I regret that I cannot complete the story by relating that I have been claimed in like manner as a sociologist. Had the book been good enough, no doubt I should have been so styled by some partial sociologist. But even then I should have been constrained to decline the compliment, along with these others, and to rest content with the title of a student and teacher of history,—"mere" history, too. At the same time, I have no objection in the world to these gentlemen coming into the historical field to gather wherewithal to build their theories; indeed, I only object that they don't come enough, and that they gather somewhat at random when they do come. No, it is not the historians who mark off exclusive fields.

Historians do object to any quaint assumption of a division of labor that tries to exclude them from reasoning about history. Possibly it would not be altogether unreasonable to object to an assumption that anyone else is better qualified than the historian to reason about history. The attitude of the men who theorize so freely on the results of the historians' work seems to us to be one or the other of these two positions.

Some of the theorists say to us, "Why, you go out, do the digging and grubbing; then bring us what you find, and we will tell you what it means; we will give it 'intelligible order.'" Is it possible these gentlemen wish to dance without paying the fiddler? Or is it simply that they fail to understand how much this dancing costs? In any case, there are two good reasons why such a differentiation of function will not come to pass. First, the historians will not take the part assigned; rest assured, if we find anything worth "arranging," we are going to arrange it ourselves, without consulting men who are not historians. And, secondly, we couldn't perform this act of self-effacement if we would; there are so few periods for which the history is yet definitely established (this is a historical secret, to be spoken in whispers) that only a student trained in historical method and practice can really tell what is good in historical writing and what is not—for the purpose of a final philosophy. And thus, when theorists who are not historians do dip into historical literature to get some basis for their ideal structures, the historians too often are moved to unholy mirth.

A more considerate school of theorists say only, as I understand Professor Giddings to do,—"But you historians *refuse* to generalize; and so we sociologists are forced to try to find some system for your facts." Yes, historians do refuse to try any universal generalization. The sociologist may think it is because we are not so near the facts that we can't see relationships; we think, of course, that we appreciate better the tremendous complexity of the material, the absolute impossibility in the present condition of human knowledge of capping the life of society with any one formula.

Some years ago at a meeting of this kind, if I remember rightly, a daring speaker told the sociologists that their "science" was only the "residuary legatee of a defunct and discredited philosphy of history." And in all seriousness I ask, what is sociology but an attempt to build a new philosophy of history,—a philosophy transformed by the new conceptions of physical science? Of course we agree with the sociologists that such a philosophy is highly desirable; the more optimistic of us hope that some time, in the dim future, it may be achieved. But we think that this philosophy, whenever it comes, will be built by historians; and we think its coming is so problematical, or at least so distant, that at present we need not concern ourselves with speculations about it. The sociologists courageously rush in, where historians—in closer touch with facts—decline to spin cobwebs. But we have no objection whatever to these other gentlemen theorizing all they please, however we may regret what seems to us misdirected effort; and even the most conservative among us will expect to draw useful hints or warnings from their guesses.

This then is the relation between history and sociology with which I am concerned. We must let each other alone, with as much of charity and good will as may be. The historian is willing that the sociologist should speculate upon history; but he does insist upon two things: the historian must be at liberty, *as a historian*, to reason upon history himself, so far as he sees it possible; and he must be allowed to carry his studies over from yesterday into to-day, when he thinks it expedient. He must be able to do these things without being called names,—either political scientist or sociologist. We will respect no fences that interfere with

our rights in these two matters. In return we will allow you gentlemen perfect liberty in our field,—and we will not call you historians, either.

FRANKLIN H. GIDDINGS: The only comment that I wish to make upon this discussion of my paper may be put in the form of a question. Do the historians wish to include the problems of social causation within the field of history, or to exclude them, as foreign to the historians proper task? I care nothing for mere labels. If history properly comprehends an examination of the problems that I have set before you to-night—and I gather from the remarks of Professor Burr and Professor West, that they think it does—I am quite as ready to hear these studies called history as to hear them called sociology. If, however, history has no business to meddle with such questions, and if the historian ought to hold—as I understand Professor Emerton to hold—that the study of social causation is an impossible undertaking, that can end only in vague and worthless generalization—the historian cannot reasonably object if those who, like myself, hold a different opinion, take to themselves another name, and attempt in their own way to build up a branch of science in which these problems are made the central themes of investigation.

TABLE OF CASES.

(Referred to in Paper and Discussions on "State Taxation of Interstate Commerce.")

	Pages
Boyer vs. Boyer, (113 U. S. 689)	82
Brown vs. Maryland, (12 Wheat. 419)	66, 67
Cooley vs. Board of Port Wardens, (12 How. 30)	64, 77
C. C. C. & St. Louis Ry. Co. vs. Backus, (154 U. S. 439)	72
Express Company cases, (165 U. S. 194)	72, 81, 86
Fargo vs. Michigan, (122 U. S. 326)	70
Field vs. Clark, (143 U. S. 649)	79
Gibbons vs. Ogden, (9 Wheat. 1)	64, 65
Hays vs. Pacific Mail S. S. Co., (17 How. 596)	81
Insular Cases	66
Leisy vs. Hardin, (135 U. S. 100)	78
Leloup vs. Port of Mobile, (127 U. S. 640)	69
Maine vs. Grand Trunk Ry. Co., (142 U. S. 217)	70
McCullough vs. Maryland, (4 Wheat. 316)	71, 74
Mercantile National Bank vs. Mayor, (121 U. S. 138)	83
Morgan vs. Parham, (16 Wall. 471)	81
Norfolk and Western Ry. Co. vs. Pennsylvania, (136 U. S. 114)	69
Owensboro National Bank vs. Owensboro, (173 U. S. 664)	82
Passenger cases, (7 How. 283)	65, 66, 74
Pelton vs. Bank, (101 U. S. 143)	82
Pickard vs. Pullman Southern Car Co., (117 U. S. 34)	72
Philadelphia & So. S. S. Co. vs. Pennsylvania, (120 U. S. 326)	70
Pullman Company cases, (117 U. S. 34; 141 U. S. 18)	72, 73
In re Rahrer, (140 U. S. 545)	77
Railroad Co. vs. Peniston, (18 Wall. 5)	71
Railroad Tax cases	71
Railway Gross Receipts Tax case, (15 Wall. 284)	70
Batterman vs. Western Union Tel. Co., (127 U. S. 411)	70
Robbins vs. Shelby County Taxing Dist., (120 U. S. 489)	65, 69
Searight vs. Stokes, (3 How. 151)	63
State Railroad Tax cases, (92 U. S. 530)	71
State Freight Tax cases, (15 Wall. 232)	65, 70, 74
Tappan vs. Merchant Bank, (19 Wall. 490)	81
Telegraph Co. vs. Texas, (105 U. S. 460)	69
Thomson and Pacific Railway Co., (9 Wall. 579)	71
Van Allen vs. Assessors, (3 Wall. 573)	80
Welton vs. Missouri, (91 U. S. 275)	69, 75
West. Union Tel. Co. vs. Massachusetts, (125 U. S. 530)	71

INDEX

Adams, Henry C., paper on "Trusts" 91 ; 108, 111, 117, 121.
Administration, overestimated savings in thro' combination, 102.
A priori method, 57.
Assessment of trusts, 122.
Assimilation, as marking birth of new stimuli, 163.
Austrian school, 177.
Balance sheet, how surplus expressed on, 31.
Banks, relations to businesses, 6 ; dangers of relationship, 7.
Bemis, Edward W., discussion on trusts, 117.
Betterment expenses, how apportioned between profits and proceeds of capital sales, 7–10 ; 25, 31.
Brewer, Justice, 79.
Buckle, on environment, 151, 193.
Buffon, 195.
Burr, George L., discussion on "Theory of social causation," 190, 199.
Business ability, lack of, 105, 119.
By-products, 101.
Capital, percentage on realized by concern operating without credit, 45 ; with credit, 47 ; relation to surplus, 23.
Cars, how taxed, 72.
Carver, T. N., Discussion on "Trusts," 132.
Cases, *see* table of cases, 201.
Cash balance, 6 ; how invested, 6.
Cash capital, *see* working capital.
"Causation, theory of social," paper by Franklin H. Giddings, 139.
Causation, 144.
Cause of progress, Benjamin Kidd, 169.
Clark, 34, 95, 96,
Classification as step to formation of science, 139.
Cleveland, Frederick A., discussion on "Loan credit in relation to corporation economics," 57.
Collateral, use of surplus for, 4.
Competitive goods, 36 ; why extant, 37 ; attempted destruction of, 38, 39 ; destruction of, 39.
Competition, need of new statement of law of, 92 ; trust, 93 ; how ineffective, 94–5 ; little restraining influence of potential, 95 ; free, no longer exists, 112.
Commercial clause, early construction of, 63, 64.
Community of interest, 110.
Comte, Auguste, 193.
Congress, power to control interstate commerce, 67–8 ; power to authorize states to tax, 84.
Consolidation, first requisite in nation forming, 187.
Constitutionality of proposed plan for taxation of interstate commerce, 77, 81.
Cooley, Charles H., discussion on "Theory of social causation," 182.
Coöperation, 160.
Corporations, recent growth in powers of, 108–9.
Cost, of production, table illustrating, 41.
Credit, how aided by surplus reserve, 45 ; gaint hrough use of, 48.
Cuvier, 139, 195.
Curtis, Justice, 65.
Daniels, W. M., discussion of "State taxation of interstate commerce," 86.
Darwin, 180, 195.
Decisions in regard to interstate commerce, summary, 69–71.
Democracy, 169.
Development, stages in, of people, 187.
Dilthey, 192.
Distribution of wealth, at basis of trust problem, 116.
Distribution of surplus reserve, 13–16, 32–3.
Dividend rate, advantages of small, 13 ; increased to distribute surplus, 13.
Dividends, from what paid, 24 ; distribution of, 13, 25, 32.
Droysen, 192.
Earnings, relation to dividends, 24.
Economics, method of reasoning in past, 58.
Economic activities, as basis for everything, 183.
Economics and sociology, 175.
Edgeworth, 42.
Elkins law, 120.
Ely, R. T., 108.

Equipment as investment for reserve, 2.
Emerton, E., 199.
Environment, 179; original stimulus, 149; effect on people, 151; relation to composition of population, 153; power to attract inhabitants, 153; fundamental types of, 154.
Ethnography, 141.
Equality, stage of, 189.
Equilibration, power of, 169.
Evolution, social, 142.
Farnam, H. W., summary of discussion on "Trusts" 132.
Financiering, dangers of, 26.
Fisher, 34.
Fixed expenses, 41.
"Free assets", 5, 7.
Fuller, Justice, 78.
Gain, through use of credit, 50.
Generalization of historians, 197.
Giddings, Franklin H., paper on "Theory of social causation," 139; closing discussion, 199; 139, 176, 179, 180, 181, 187, 188, 190, 194, 199.
Goodnow, Frank J., paper on "State taxation of interstate commerce," 63, 87, 89, 90.
Government control, 106.
"Graft," corporation, 26.
Grey, John H., discussion on "Surplus reserve," 17.
Gray, Justice, 79.
Gross receipts, when tax on justified, 70.
Gumplowicz, 147.
Gunton, 91, 92.
Habitat, physical, influence of, 157.
Hadley, 53.
Harlan, Justice, 79.
Hatfield, Henry Rand, discussion on "Management of the surplus reserve," 28.
Heterogeneous peoples, 161.
High finance, 45.
Historians have not set off exclusive fields, 195.
History, its nature as regards cause and effect, 182; prime aim of, 190; called a method, 191; is society, 191; its need of other studies, 193; philosophy of, 198.
Hobbes, 147.
Hollander, J. H., Discussion on Trusts, 131.
Homogeneous people, 168.
Hume, 92.
Idealistic view of cause and effect in history, 184.
Ideas, social, 164.
Improvements, how should be paid for, 21–22.
Independent producer, seldom helpless, 115.
Industry, character of as determining apportionment of improvement and repair charges, 21–22.
Industrial conditions, analysis of, 107.
Industrial commission, 37, 90.
Institutions as the response to stimuli, 144.
Interpretation, relation to history, 177.
Interstate commerce, power of states to tax, 63; how indirectly taxed by state, 73; advantages, 73.
Investment of surplus reserve, 2, 30; in securities not connected with the business, 2; in plant and equipment, 2; in other businesses, 2, 18, 27, 31.
Jenks, J. W., 95.
Johnson, Justice, 65.
Judson, Frederick N., discussion in "State taxation of interstate commerce," 86.
Kidd, Benjamin, his cause of progress, 169.
Labor, its relation to trust problem, 120.
Labor organizations as a cause of combination, 106.
Lamarck, 180.
Law and economic conditions, 115–6.
Legal structure of society behind economic structure, 108, 110.
Lehigh Valley R. R., betterment policy of, 10–11.
LeRossignol, J. E., discussion on "Trusts," 113.
Liberty, individual, at minimum in early stage of consolidation, 188.
License taxes, which ones held improper, 69.
Linnæus, 139, 195.
Little, Stephen, on betterment expenses, 7; his recommendations, 8; final application of his recommendation, 8–10.
"Loan credit in relation to corporation economics," paper by J.

Pease Norton, 34; discussion by F. A. Cleveland, 57.
Locke, 92.
Mahan, Capt. A. T., 186.
Management of surplus, why different from that of capital, 24.
Manipulation of stock, 26.
Marginal utility, 35.
Marshall, Justice, 64, 67, 71, 74.
Materialistic view of cause and effect in history, 182.
Matthews, Justice, 83.
Meade, Edward S., paper on "The management of the surplus reserve," 1; 17, 18, 19, 20, 26, 32.
Menger, Carl, 177.
Method used by Prof. Norton, 57.
Mill, John Stuart, 106.
Monopoly price, in business world, 39–40.
Monopoly, as producing a trust, 121.
Montesquieu, on influence of physical habitat, 151.
Motes, 145.
Natural law resulting in trusts, 91.
Natural selection, 180.
Non-competitive goods, 36.
Norton, J. Pease, paper on "Loan credit in relation to corporation economics," 34; method used by, 57; method of presentation, 59; 57, 58, 59, 60.
Novicow, 147.
Omnibus powers of modern corporations, 109.
Operating expenses, abnormal, 11; as used to conceal large profits, 11; justice of increasing in years of large operation, 11–12, 13.
Organic view of cause and effect in history, 185; its relation to method of history, 186.
Organization as mode of human activity, 146.
Organization, as a productive principle, 97.
Pareto, 34.
Pearson, Karl, 42.
Percentage, on capital realized by corporation operating without credit, 45; with credit, 47; gain through use of credit, 48.
Plehn, Carl C., discussion on "State taxation of interstate commerce," 89.
Population, in poor isolated locality, 154; in poor, accessible locality, 155; in rich, inaccessible territory, 155; in rich, accessible territory, 155; mental characteristics as affected by above, 158.
Poor's Manual, 8.
Post, Louis S., 121.
Potential competition, 95–6.
Price slashing, 37–38.
Productive ability, its relation to size, 98.
Productivity of trusts, 97, 128; size of maximum, 99.
Progress, causes of, 169.
Proletariat, rise of, 187–190.
Property of interstate agency, how taxed by state, 73.
Psychology of customers, 36–7.
Publicity, 56; need of, 22–3, 27; an unsatisfactory and incomplete remedy for trust evils, 118.
Railroad problem, its relation to trust problem, 105, 120.
Railroad property, changed rule for assessment, 71.
Railroad rates, control of, 12.
Reconciliation of conflicting rules on taxation of interstate commerce, 76.
Regulation of commerce taxation, a form of, 65.
Relation of industries, 20, 21, 67.
Remedy for difficulties of taxation, of interstate commerce, 17.
Repairs, how to be paid for, 21–22; 32.
Reserve, management of surplus, paper by Edward S. Meade, 1.
Reserve, defined, 1; purpose, 1; *see* investment.
Rickert, 193.
Robinson, Maurice H., discussion on "Trusts," 123.
Rousseau, 147.
Rosewater, Victor, discussion on "Management of surplus reserve," 23.
Running expenses, 41–2.
Savings incident to large production overestimated, 101.
Schwab, 122.
Seignobos, 140.
Seligman, E. R. A., 90, 191.
Seyès, Abbé, 189.
Simmel, 192.
Size, not necessary feature of a trust, 117–8; as measure of productive ability, 98, 99.
Small, Albion W., discussion on

"Theory of social causation," 175.
Smith, 92.
Social events, three stages in study of, 194.
Social freedom, stage of, 189.
Social point of view, 178.
Social progress as a psychological phenomenon, 145.
Sociology and economics, 175; and history, 176.
Solutions of trust problem, 103; criticisms of suggestion for, 118.
Spencer, Herbert, 146, 152, 180, 182.
Stability caused by investment of surplus reserve, 3.
State freight tax, 65.
State, indirect taxation of interstate commerce, 73.
"State taxation of interstate commerce;" discussion by W. M. Daniels, 86; Frederick N. Judson, 86; Carl C. Plehn, 89.
Statistics, social, 140, 142.
Stimuli, relation to theory of social causation, 150; response to, 147, 179; present responses to earlier stimuli, 149; secondary, 149; original, 149.
Strong, Justice, 74.
Subscription, privileged, as means for distributing surplus, 14; little understood by public, 15.
Sumner, 35, 36, 40.
Surplus reserve, management of, paper by Edward S. Meade, 1; discussion by John H. Grey, 17; Victor Rosewater, 23; Henry Rand Hatfield, 28.
Surplus reserve, purpose of establishing, 28; amount needed, 17; amount varies with business and form of organization, 29; why different management for, 24; belongs to shareholders, 23; relation to capital stock, 23, 31; investment of, 30; how apportioned between betterments and repairs, 31–2; how distributed to stock holders, 13, increased dividend rate, 13; privileged subscription, 14; 22, 23, 32; *see* reserve.
"Survival of the fittest" as applied to trusts, 113.
Taarde, M., 194.
Table, illustrating transverse business affiliations, 111.
Taine, 193.
Taney, Justice, denies taxation is regulation, 66.
Taxation, 66; under unit rule, 86; not regulation according to Taney, 66; decided to be regulation, 66; of commerce, growing need of, 68; importance of power of, 74–5.
Taylor, W. G. L., discussion on "Trusts," 130.
Telegraph property, how assessed, 72
Theory of social causation, paper by F. H. Giddings, 139; discussion by Albion W. Small, 175; Charles H. Cooley, 182; Lester F. Ward, 187; George L. Burr, 190; Willis M. West, 193; F. H. Giddings, 199.
"Trusts," paper by Henry C. Adams, 91; discussion by B. H. Meyer, 108; J. E. LeRossignol, 113; E. W. Bemis, 117; M. H. Robinson, 123; W. G. L. Taylor, 130; J. H. Hollander, 131; T. N. Carver, 132; H. W. Farnum, 132.
Trust, defined, 91, 123; Adams' definition criticized, 117; the result of natural law, 91, 124; development of conditions producing, 91–3; to what extent productive, 97; problem, complex nature of, 173; relation to monopoly, 121.
Unification, 167.
Unity, element of in social groups, 165; the first great ideal, 166.
Variables, table of, 43.
Wall street, 35.
Wallace, 180.
Wanamaker, John, 37.
Ward, Lester F., discussion on "Theory of social causation," 187.
Watts, C. J., 40.
Wealth, destined for consumption, 34.
Weber's law, 34.
West, Willis Mason, discussion on "Theory of social causation," 193; 199.
White, Justice, 82.
Working capital, amount required, 6.
Wundt, 192.

PUBLICATIONS

OF THE

AMERICAN ECONOMIC ASSOCIATION

THIRD SERIES. ISSUED QUARTERLY.
VOL. V, NO. 3. PRICE, $4.00 PER YEAR.

MONOPOLISTIC COMBINATIONS

IN THE

GERMAN COAL INDUSTRY

BY

FRANCIS WALKER

AUGUST, 1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON: SWAN SONNENSCHEIN & CO.

Copyright, 1904, by
AMERICAN ECONOMIC ASSOCIATION

PRESS OF
ANDRUS & CHURCH
ITHACA, N. Y.

PREFACE

The present study of the coal combinations in Germany was made by the writer during a recent sojourn in that country (1902–3). The immediate incentive was the desire to observe more closely the particular development of the world-wide movement of combination. The desire was stimulated by the fact that an extensive investigation of the subject was initiated at that time by the Imperial Government. A general survey of a considerable part of the German literature on the subject convinced the writer that at present the scientific need was in the direction of special rather than general studies. There already exist a number of very intelligent general treatises, such as those of Liefmann, Pohle and Grunzel, and any further general discussion of the subject could scarcely be more than a repetition or *réchauffé* of familiar propositions in either a controversial or an eclectic form. In certain branches of industry, notably in sugar and spirits, a considerable number of special treatises have been written, based on a close study of the business and technique, but, so far as the present writer knows, there has been nothing attempted in the most important and fundamental of all German cartelled industries, namely, mining and metallurgy, beyond magazine articles and pamphlets. The great amount of literary and statistical material respecting the coal industry, though widely scattered, makes the subject peculiarly suited to a more detailed analysis.

The writer has had the advantage of making two visits to Westphalia and another to Luxemburg (the principal coal and iron districts), and has also had the

opportunity of meeting and talking with some of the leaders in these industries. In this connection he wishes to express his special indebtedness and thanks to Herr Prof. von Halle of the University of Berlin and to Herr Director Dernburg, chairman of the Bank für Handel und Industrie and also chairman of the Deutsche-Luxemburgische Bergwerks- und Hütten A.G. The publication of the results of the recent government *Enquete* brought, of course, a large amount of new material for analysis, but the writer believes that much of that previously published has escaped the attention, or at least the practical utilization, of those who have written on this subject. Some of the most familiar material has been erroneously used.[1] In regard to the statistical material itself, a possible question might arise as to its reliability. A large part of it comes necessarily from the producers themselves (including official government statistics), and is beyond any direct means of control. Nevertheless indirect means of control are frequent, and tend to confirm such figures, while in instructed circles their honesty does not seem to be questioned. This also is the position of the writer, who has given them full faith and credit, as due to the *Treu und Glauben* which the German business man claims as his preëminent virtues.

FRANCIS WALKER.

New York, Dec. 23, 1903.

[1] The Prussian Minister of Trade and Industry and Herr Calwer, a well known economic writer, have used certain official statistics as figures of price when they are really figures of cost. (See p. 153).

CONTENTS

PREFACE ..... Page iii

MAP

INTRODUCTION ..... Page 1

PART I. GENERAL ASPECTS OF THE COAL INDUSTRY

CHAPTER I. COAL SUPPLY ..... Page 5

Coal deposits of Germany, p. 5. Kinds of coal produced, p. 8 Manufactures of coal, coke, brikets, etc., p. 11.

CHAPTER II. MARKETS ..... Page 12

Coal consumers, p. 12. Local Markets, p. 13. National competitive markets, p. 15. International markets, exports and imports, p. 19.

CHAPTER III. TRANSPORTATION ..... Page 24

Cost of transportation and delimitation of markets, p. 24. Water transportation facilities, p. 25. Railways, p. 25. Costs of transportation to important markets, p. 28.

CHAPTER IV. CAPITAL, ORGANIZATION AND LABOR ..... Page 30

Estimate of value of coal properties in 1902, p. 30. Capitalistic form of industry, p. 32. Mining Law, p. 33. Organization of companies, p. 33. Labor supply, p. 35.

PART II. HISTORY OF COAL COMBINATIONS

CHAPTER I. HISTORY OF THE COMBINATIONS IN THE RUHR BEFORE THE SYNDICATES ..... Page 38

Early history of the coal industry, p. 38. Cause of cartell movement, p. 39. History of early cartells, p. 40. Formation of the coal and coke syndicates, p. 49.

CHAPTER II. OTHER COAL CARTELLS ..... Page 50

Organization of coal interests in other districts, p. 50.

CHAPTER III. HISTORY OF THE OPERATION OF THE COAL AND COKE SYNDICATES OF THE RUHR ..... Page 53

Operations of the coke syndicate, 1890–1895, p. 53. Beginnings of the coal syndicate, 1893–1895, p. 56. Operations of the coal and coke syndicates during the *Hausse*, 1895–1900, p. 59. The coal famine and the crisis, 1900, p. 65. The coal and coke syndicates during the hard times, 1901–1902, p. 72.

PART III. INTERNAL ORGANIZATION AND POLICY OF THE COAL AND COKE CARTELLS

CHAPTER I. THE RHENISH-WESTPHALIAN COAL AND COKE SYNDICATES ..... Page 78

Analysis of the constitution of the coal syndicate, p. 78. Constitution of the coke syndicate, p. 85. Treaty of the coke syndicate with the Belgian syndicate, p. 89. Operation of the cartell constitutions and the internal policy of the cartells, p. 90. The movement for reorganization, p. 100. The new constitution, p. 103. Recent developments, p. 109.

CHAPTER II. THE COAL CONVENTION OF UPPER SILESIA. Page 112

Analysis of the cartell constitution of the convention, p. 112.

PART IV. ANALYSIS OF THE OPERATION OF THE COAL AND COKE CARTELLS

CHAPTER I. PRODUCTION OF COAL ..... Page 121

Quantity of production, p. 121. Cartelled and non-cartelled production, p. 121. Consumption, p. 123. Regulation of production, p. 126. Technical control of the output, p. 127. Apportionment and limitation of the output, p. 128. Economy of production, large and small concerns, cartells, p. 138. Relation of cartells to technical progress, p. 141. Preservation or elimination of poor mines, p. 142. Quality of coal, p. 143.

CHAPTER II. COST OF PRODUCTION OF COAL ..... Page 145

Relation of the various elements of cost to the progress of mining, p. 145. Technique, p. 146. Depth and richness of deposits, p. 147. Wages, p. 149. Materials, p. 149. Public burdens, p. 150. Estimates of average cost of production in the Ruhr, p. 152. Margin of cost, p. 156. Costs in other districts, p. 158.

CHAPTER III. PRODUCTION AND COST OF PRODUCTION OF COKE ..... Page 160

Production and consumption of coke, p. 160. Technical conditions of production, p. 164. Apportionment and limitation of output, p. 165. Economy of production, large and small concerns, the syndicate, p. 168. Quality of coke, p. 169. Cost of production of coke, p. 171. Estimate of cost on basis of average cost of coal, p. 172. Relation of by-products to cost, p. 173.

CHAPTER IV. PRICE POLICY IN GENERAL ..... Page 175

Prices and proceeds, p. 175. General price history in the Ruhr, p. 180. In Upper Silesia, p. 184. In the Saar, p. 187. In Lower

Silesia, p. 190. Price policy of outsiders, p. 191. Price movement of coke in the Ruhr, p. 192. Coke prices of outsiders in the Ruhr, p. 196. Comparison of the coke prices of the Ruhr and the Saar, p. 196. Prices in Germany compared with other European countries, p. 197. Prices in competitive districts in Germany, p. 202.

CHAPTER V. EXPORT PRICES AND EXPORT BOUNTIES Page 208

Low export prices and their economic significance, p. 208. Policy of the coal syndicate, p. 211. Of the coke syndicate, p. 214. Extent of low export prices tested by proceeds, p. 216. Export bounties, p. 219. Development of the bounty policy in the Ruhr, p. 220. Amount of bounties and extent of low export prices tested by assessments (Umlage), p. 225. Criticism of bounty policy, p. 228.

CHAPTER VI. EFFECT OF PRICE POLICY ON INDUSTRY Page 230

Relation of coal prices to the industry under the cartell régime, p. 230. Comparison of price movements of coal and iron, p. 231. Element of coal cost in iron manufactures, p. 233. Question of cause of crisis in German iron industry, p. 234. Profits and stock quotations of iron concerns, p. 238. Relation of coal prices to textile, sugar, cement, lime, transportation and other industries, p. 244. Coal prices and the general consumer, p. 246.

CHAPTER VII. PROCEEDS AND PROFITS Page 247

Proceeds and profits a test of reasonable prices, p. 247. Analysis of proceeds per ton and estimates of profit therein for coal in the Ruhr, p. 247. Statistics of dividends and profits, p. 256. Depreciation accounts, p. 262. Proceeds in Upper Silesia, p. 263. Proceeds and profits in the Saar, p. 264. Proceeds for coke in the Ruhr, p. 264. Difficulty of measuring cost and profit, p. 268.

CHAPTER VIII. ORGANIZATION OF SALE AND THE COAL TRADE Page 269

The syndicates as selling organizations, p. 269. Price differentials of the coal and coke cartells, p. 269. Regulation of the terms of sale, p. 271. The coal dealers, p. 278. Services and costs, p. 279. Exorbitant prices, p. 279. Attempt at control by the syndicate, p. 280. Present position of dealers, p. 282. Consumers' associations, p. 283. Significance of the movement, p. 283. Relations with the coal cartells, p. 284.

CHAPTER IX. CONDITION OF LABOR UNDER THE CARTELL RÉGIME Page 290

No direct relations between the cartells and labor, p. 290. Course of wages, p. 290. Productivity of labor, p. 294. Wages in cartelled and non-cartelled concerns, p. 291. Regularity of employment, p. 297. Hours of labor, p. 299. Other conditions of work, p. 301. Effect on labor organizations and the independence of the laborer, p. 302. Strikes, p. 303.

PART V. REGULATION AND REFORM

CHAPTER I. PRESENT SITUATION ..... Page 304
Status of German law respecting combination and monopoly, p. 304. Classification of methods, p. 305.

CHAPTER II. LEGAL REGULATION ..... Page 307
Criminal law, p. 307. Civil law, p. 308. Administrative law, p. 308. Publicity, p. 308. Cartell bureau, p. 309. Limitation of dividends, p. 311. Price regulation, p. 311.

CHAPTER III. ECONOMIC REGULATION ..... Page 312
Control through customs duties, p. 312. Railway rates, p. 314. Fiscal cartells, p. 316. Nationalization, p. 317. Self-help, p. 321.

CONCLUSION ..... Page 322

BIBLIOGRAPHICAL REFERENCES ..... Page 328

INTRODUCTION.

The problem of monopolistic combination is one of the most serious, perhaps the most serious, which confronts the student of economics at the present day. It is of world-wide significance, and it goes to the very roots of our social organization, demanding, possibly, a reconstruction of both the theory and the practice of our economic life. Variations of the same phenomena appear in every modern industrial state, namely the development of large business organizations, and in a greater or less degree, the substitution of monopoly for free competition. Industrial leaders and lawyers, statesmen and scientists have been compelled to face new problems the proper solution of which is of vital importance to the welfare of the individual and the state.

To meet this problem in a narrow spirit by the study of particular conditions or local experience would afford little hope of a wise solution or a successful policy. It would disregard, moreover, the fact that in some important phases the particular manifestations are international in scope and influence. The problem, therefore, must be studied as a world-problem, and the interest of each nation extends, or should extend, to the situation in other lands. For this reason, apart from all questions of purely scientific interest, the study of the monopolistic combinations in Germany, or cartells, as they are called there, is of real interest to other nations. The proper study of such a problem is not the occupation of an idle hour, nor are the opinions of superficial writers or their hasty generalizations of a vast number of very intricate phenomena over the

whole field of a nation's industry worthy of even such trivial attention. Unfortunately most of the writings on the subject are of this sort. On the other hand, there are some excellent general treatises on the subject, but their conclusions can not be regarded as final. Two things are lacking, first, a sufficient basis in the direction of detailed analysis, second, mature experience with the new economic institutions. The present study aims to contribute something toward supplying the first want by describing in detail the combinations, or cartells, in the German coal industry. The fact that their history covers a period of twenty-five years relieves it from the charge of being premature. Though the solution of the problem of monopolistic combination cannot be successfully obtained by the study of any one country, and *à fortiori*, any one industry, yet, the study of certain important cartells in detail is one of the most effective means of getting correct and vivid ideas of the real character of the problem.

Whether we consider its size, its industrial importance, or the ingenuity and perfection of its organization, there are few combinations in the world, and none in Europe, that equal or surpass the great coal cartell on the Rhine. What is equally important, and for the present purpose necessary, is that we are able to construct a remarkably clear record of its operations and of those of its rivals for a considerable term of years.

The fact that there are keen outsiders, and rival combinations in other parts of the Empire; the fact that there are important and intimate alliances with other cartells, both foreign and domestic; the fact that Germany is both an exporting and an importing country, and meets England in rivalry from the Baltic to the Mediterranean, (not to speak of other countries),

all give the problem a special interest and value. Of special interest, however, is the fact that the government (in particular the Prussian fiscus) is itself a great coal producer. The often advocated remedy for private monopoly, namely, nationalization is here put to a practical test in the most effective manner and under the most advantageous circumstances. We have therefore competition and monopoly, private ownership and state ownership in a great variety of phases. Another fact, of special interest to Americans, is that we have the opportunity of studying the growth of monopoly in a land where the railways are owned by the state, and, hence, where the combinations are unable to obtain abnormal nourishment and support from preferential rates or rebates.

It is proposed to examine the history, the organization and the practical operation of these combinations paying special attention to their policy in regard to production and price, the effect on other industries and their relations to the dealers and to labor and the problem of State control. The reader is warned that some questions which are of great importance, for example, in America are quite unimportant in Germany, and therefore receive little attention. This indeed is not the least valuable or instructive part of such a study, and helps to differentiate the accidental from the substantial features of the problem.

PART I

GENERAL ASPECTS OF THE COAL INDUSTRY

CHAPTER I

COAL SUPPLY

Germany stands second in Europe with respect to coal supply, with England first and France third. According to recent estimates of Nasse, Lexis and others, the chief ascertained sources of supply are, in Europe, United Kingdom 198 billion tons, Germany 112 billion tons, France 18 billion tons, Russia 17 billion tons, Belgium 15 billion tons, etc. The United States is put at 684 billion tons, and China, it is thought, may have an equally great supply. Australia is put at 240 billion tons.[1]

The coal deposits of Germany lie chiefly in three districts, all of which are situated in Prussia. The largest, according to the usual estimates, is in Westphalia and the Rhine province, mostly on the right bank of the Rhine, north of the river Ruhr. It is generaly called the Ruhr district. The second most important district lies in Upper Silesia and laps over into the contiguous empires of Austria and Russia. About three-fourths of the coal is in Silesia.[2] The third important deposit is in the extreme southwestern end of the Rhine province and runs across into Lorraine and the Bavarian Palatinate. It takes its name from the river Saar which runs

[1] Lexis, p. 1077-8; Renauld, p. 43; *Oesterr. Zeitschr, B. f. u. H.*, 1902, p. 426. These statistics are incomplete as well as largely conjectural.

[2] Renauld, p. 39; one-fifth in Austria.

through it. Coming now to the smaller coal fields, we have, first, the Wurm or Aachen district, which also lies in the Rhine province on the border of Belgium, second, the Lower Silesian or Waldenburg district, in the northwestern part of the province of Silesia and near the Bohemian border, third, the Zwickau district in the kingdom of Saxony. According to Nasse, the estimated available stocks in these districts are as follows: the Ruhr, 50.0 billion tons, Upper Silesia, 45.0 billion tons, the Saar, 10.4 billion tons, Aachen, 1.8 billion tons, Lower Silesia, 1.0 billion tons, Saxony, .4 billion tons, and for the rest of Germany, .4 million tons, giving a total of 109.0 billions.[1] Besides Steinkohle, or coal proper, there are considerable deposits of Braunkohlen, or lignite, lying chiefly in central Germany, in Prussia, (provinces of Saxony and Hannover and in the Rhine province near Cologne), Anhalt, Sachsen-Altenburg, Brunswick and the kindom of Saxony. Lexis reckons these deposits at about five billion tons which is equivalent to perhaps three billion tons of Steinkohlen.[2] The

[1] Quoted by Renauld, p. 42. These estimates vary greatly. Bergrath Grassmann recently stated there were 54.3 billion tons in the Ruhr at a depth of 1500 meters. *Stahl u. Eisen*, 1902, p. 846. A recent estimate for Upper Silesia was as follows: At 1000 m., 62.8 billion tons; at 1500 m., 101.55 billion tons, and at 2000 m., 140.8 billion tons. *Stahl u. Eisen*, 1901, p. 1063.

[2] Lexis, pp. 1077–8, 1081. Another way to get an idea of the available supply, as well as the nature of the mining problem, is to find the area of the field and the number and richness of the seams. The following table gives a rough idea of the facts.

District.	*Area Sq. Km.*	*Seams Workable.*	*Total Thickness.*
Ruhr	2800	65	65.4 m
Upper Silesia	450	104	154.8 m
Saar	385	82	77.6 m
Lower Silesia	200	16	----
Saxony	220	9	----
Aachen	21	28	----

Koepper, 24–5; Lueger, p. 676.

Ruhr has seams of moderate thickness and accessibility. The deep shafts are about 700 meters, generally. Upper Silesia has seams of extraordinary thickness and accessibility. Renauld says there are usually from four to six meters of pure coal, and often nine to twelve meters, while the average depth is from 200 to 300 meters.[1] The mines of the Saar appear to be rich, but deep, difficult, and dangerous.

Of more immediate interest are the statistics of production. According to a recent estimate the total production of the world in 1901 was 789,128,476 tons (metric). The principal producing countries and their respective shares are shown in the following table.[2]

British Empire		244,463,996 tons.
United Kingdom	222,562,125	"
Canada	5,612,108	"
India	6,742,214	"
Germany		153,019,414 "
Austria-Hungary		40,757,895 "
France		32,325,302 "
Belgium		23,462,817 "
Russia		16,151,557 "
Spain		2,747,724 "
Japan		7,429,457 "
United States		266,151,103 "

About two-thirds of the Austro-Hungarian and one-third of the German production was of brown coal or lignite.

The production of Steinkohlen for the various parts of the German Empire for 1902 is given in the following table.

District of	Breslau	29,055,054	tons.
"	Halle	9,882	"
"	Klausthal	684,092	"
"	Dortmund	58,038,594	"
"	Bonn	12,327,693	"
Total	Prussia	100,115,315	"
	Bavaria	1,233,569	"
	Saxony	4,611,500	"
	Alsace-Lorraine	1,309,818	"
	Rest of Empire	166,132	"
	Total Empire	107,436,334	"

[1] Renauld, 38–41.

[2] *Oesterr-Zeitschr. B.u.H.*, 1903, p. 347.

The production of brown coal was 43,000,476 tons which would give a grand total of 150,436,810 tons.[1] In explanation of the above table it is sufficient to say that the Ruhr district is embraced in the Dortmund district, the output of Upper and Lower Silesia under Breslau, the Saar and Aachen output under Bonn, and the production of Zwickau under Saxony.

Coal as an article of commerce has a great many varieties which are adapted to different uses and command widely different prices. The differences in kind depend first, on the physical and chemical qualities of the coal, and, secondly, on the size or mixture of sizes. An idea of the extent to which this classification is carried as a matter of practical business may be gathered from the fact that the list of standard prices of the Rhenish-Westphalian coal syndicate contains 108 different assortments, depending on quality, size, refinement and mixture, and that the prices of the same may vary from 4 marks to 22.50 marks per ton.[2] If the different brands, as well as the different sorts, are counted the number exceeds perhaps 1400.[3]

The classification of coal depends chiefly on the chemical composition, that is, the relative amounts of hydrogen, oxygen, and sulphur, combined with the carbon. The outward evidence appears chiefly in the flame, the greasiness, and hardness, and the character

[1] *Vierteljahrshefte z. Statistik d. Deutschen Reichs*, 1903, II, pp. 102–3. Of the brown coal, 36,122,147 tons were produced in Prussia, of which 29,127,798 came from the mining district of Halle (principally Province of Saxony), and 5,461,373 tons from the mining district of Bonn. Saxony produced 1,726,970 tons, Brunswick 1,307,867 tons, Anhalt 1,278,112 tons, and Sachsen-Altenburg 2,181,661 tons.

[2] Enquete, p. 282–4; table of prices given.

[3] *Cent. Verband, D. I.* 1901, p. 244.

of the ashes, etc. In the terminology of the Ruhr the principal kinds are as follows:[1]

Langflammige Kohle (long flame coal)	1. Trocken (dry). 2. Gas and Gasflamm, Fett (greasy).
Kurzflammige Kohle (short flame coal)	3. Fett or Schmiede (forge). 4. Halbfett (half greasy) or Ess (draft). 5. Mager (lean) and Anthracit.

The first—dry coal with a long flame—is a hard lively burning coal adapted to boiler firing as its ashes do not encumber the grate. The second—greasy coal with a long flame—is the gas coal *par excellence*, because, besides furnishing gas richly, it cokes well, giving a valuable by-product. It is also used in industry, in puddling furnaces and as a house fuel. As the coke made from it contains sulphur, it is not adapted to metallurgical uses. The third—greasy coal with a short flame—is the real Fettkohle which is a fine steam and coke coal. It bakes together well when coked and can stand the pressure in a blast-furnace, while it is very free from sulphur or other injurious constituents. The fourth—half-greasy coal with a short flame—requires a strong draft; it burns with little smoke and is suitable for cities. The fifth—lean and anthracite—was formerly much despised in Germany, but now some of the best varieties, *i. e.*, anthracite, command high prices. It is the purest in carbon, but does not burn easily. The Mager coal is used in the Ruhr district chiefly in brick and lime-kilns.[2]

Brown coal, or lignite, is sharply distinguished from Steinkohle, both as a substance and as a commodity, and does not specially interest us here.[4]

[1] Koepper, p. 46.

[2] Koepper, pp. 46–8; Steinkohlenzechen, pp. 81–3.

[3] It belongs to a different geological era, and often looks more like earth than coal. It has, indeed, a very low percentage of carbon, and hence low heating power.

Of the various kinds of Steinkohlen, all those described above appear in large quantities in the Ruhr, but it is particularly rich in the most desirable kind, viz., Fettkohle.[1] The Saar coal is largely of the long flame variety; the Aachen coal, on the other hand, is mostly short flame;[2] while the Upper Silesian coal is largely gas coal.[3]

The variations of size in coals results from the methods of getting it out, from the physical consistency of the coal, and from the various processes of refinement. A great deal of coal is used just as it comes out of the mine, though less so than formerly; this is called Förderkohle (run of the mine). Coal is also refined on a very extensive scale, and different grades and sizes are sometimes subsequently mixed again, especially for fine steaming qualities. For large pieces, the separation is made by hand, but for the smaller sized coal by mechanical processes, dry or wet. The former is accomplished by jigs and screens; the latter applies water also, which facilitates the separation of the slate and bone owing to their greater specific gravity, and cleanses the coal of dirt. The names and measurements of the different sizes vary, but the following may be taken as characteristic.[4]

Stück	Over 80 mm.
Würfel	80–40 mm.
Nuss	40–15 mm.
Grus	15– 8 mm.
Staub or Fein	Under 8 mm.

[1] The production of the Ruhr syndicate, which includes most of the output of the district, shows the following distribution in 1902. Fett, 59.37 per cent; Gas and Gasflamm, 28.62 per cent; Ess and Mager, 12.01 per cent. Bericht d. Kohlen Syndicat, 1902.

[2] Koepper, p. 44.

[3] Renauld, p. 41.

[4] Lueger, p. 677.

The most important product in the manufacture of raw coal is coke. The distillation of coal produces coke, gas, tar, ammonia, benzol, etc. At coal mining works coke is the chief product and gas is a by-product generally consumed in the heating of the coke furnaces or for other similar purposes. When the coke is drawn out of the retorts or ovens, it is cooled quickly with water, and appears for the most part in large tough pieces suitable for the blast furnace. The coke is also sized, and, according to its size, strength and purity, it is used for different purposes, such as smelting, forging, steaming, house-heating, etc. The ammonia is mostly converted into a sulphate, and used as a fertilizer.

Another important manufacture of the coal industry are Brikets. These are bricks, ellipsoids, etc., made either from Steinkohle or Braunkohle, which must be reduced to a fine size, and cleansed of impurities, and then pressed into shape, and cemented together with tar or some cohesive substance. Braunkohle is so impure that, without this process of refinement, it would not be applicable to many uses, nor worth distant transportation. But Brikets from Steinkohle have distinct advantages also which, according to Lueger, are, (1) non-changeability of substance, (2) uniformity of quality, (3) facility for storage, (4) easy combustion, (5) little smoke. They are used in Germany with great success both in industry (*e.g.*, locomotives) and for house-fuel.[1]

[1] Lueger, pp. 679–80; Steinkohlenzechen, pp. 84–5.

CHAPTER II

MARKETS

The chief conditions determining the market of coal are: (1) climate, (2) population, (3) industrial development, and (4) cost of transportation. The last circumstance tends to limit the area of sale and to concentrate or confine large coal-using industries to the neighborhood of the source of supply. But a cheap labor supply is more important for some industries than cheap coal, and, especially in older communities, it may be more practicable to transport the coal than the labor power. Of course in a northern country the use for house-fuel is of great importance; there is also need of coal for gas production; here the market depends chiefly on the density of population. The following table of the consumptive uses of coal produced in the fiscal mines of the Saar in 1899 (over 9,000,000 tons) is probably a fair example of the situation in Germany.[1]

Iron industry (including coke coal)	28.04 per cent
Railroads	9.82 "
Gasworks	9.18 "
Textile industry	3.20 "
Chemical factories	2.81 "
Glass industry	2.52 "
Salt works	0.38 "
Sugar factories	0.66 "
Porcelain, stoneware, etc.	2.44 "
Machine factories	1.26 "
Cement factories	1.22 "
Paper factories	.82 "
Other industries	.82 "
Commerce and house fuel	26.22 "
Consumed in coal mines	10.61 "

It will be observed that the iron industry alone takes one-fourth, and other industries (not including gas) take

[1]Bericht d. X Commission, pp, 11–12.

about one-sixth. A part of that designated commerce and house-fuel is undoubtedly sold for industrial purposes abroad, so that gas and house-fuel account for less than one-third. A record for the consumption of the Ruhr coal would undoubtedly show a relatively greater industrial consumption, while the element of house-fuel would be more important probably in Upper Silesia (Berlin market).[1]

The market for coal may be divided into three parts: (1) local, (2) national, and (3) foreign. Each has its peculiar character and conditions.

The local markets in the principal coal producing regions of Germany are, of course, chiefly industrial, as they are the seats of those industries in which coal is an important factor in the cost of production. This is especially the case of the iron trade. Industry has been forced to a large extent to establish itself where the coal is mined and at points often ill-situated for the marketing of the commodities produced. In the course of time these regions become great centres of population, and then the local market becomes the richest as well as the nearest. This is well illustrated by the situation of the Rhine province and Westphalia in the region of the Ruhr. The Ruhr district in 1895 (3600 sq. km.) had a population of 2,400,000 or 656 per sq. km; the population per sq. km. for the Empire in 1895 was 96.7. The railway freight shipments of the Ruhr district were 73,000 tons per km. of railway, compared with 8,500 tons per km. for the Empire, etc.[2] The Rhine province and Westphalia are the most populous of the larger districts of Germany next to Saxony.[3] In the iron indus-

[1] *Cf.* Renauld, p. 76; Aeltesten d. Kaufmannschaft, 1901, II, p. 15.

[2] Sympher, p. 23.

[3] *Statistisches Jahrb. f. d. Deutsche Reich*, 1902.

try it is often a question whether to take the coal to the iron mine, or the ore to the coal mine, a problem, that here as elsewhere, is solved both ways; coke is sent from the Ruhr to Siegerland, Lorraine and Luxemburg, and, *vice versa*, the iron ore of Siegerland, Lorraine and Luxemburg is hauled to the coal region to make up its great deficiences in ore supply.[1]

Considering the large development of industry and the density of population in the Ruhr district, it is not surprising that half of the total coal production is consumed there.[2] In Upper Silesia, the immediate locality has no such development as the Ruhr and requires only one-fifth of the production. The Province of Silesia, however, consumed nearly one-half.[3] In Lower

[1] The location of the raw iron production of the Zollverein in 1900 was as follows:

Rhineland and Westphalia (excl. Saar and Siegerland)	3,270,373	tons.
Siegerland and Lahn	739,895	"
Silesia and Pomerania	847,648	"
Kingdom of Saxony	25,598	"
Hannover and Brunswick	344,012	"
Bavaria, Württemberg and Thuringia	143,777	"
Saar, Lorraine and Luxemburg	3,051,539	"
Total	8,422,842	"

Glückauf, 1901, p. 242.

[2] *Cf.*, Sympher, Anlage, 9. In 1901 the consumption of the Ruhr district proper (both Rhenish and Westphalian) amounted to almost exactly 50%; the shipments outside the district were 29,116,051 tons; the production of the district was 59,004,609 tons, leaving a local consumption of 29,888,558 tons. (Shipments calculated from data of van der Borght, *Conrad's Jahrb.*, 1903, III, pp. 187–8; production from Bericht d. Kohlen Syndicats, 1902.)

[3] The total production in 1902 was 24,443,100 tons: 18.43% were consumed in smelters and coke works of the locality, and nearly 3% more for all other purposes; 17,068,290 tons were shipped by main railways (including a trifling amount of coke and brikets), and of this quantity 6,502,813 (26.6%) was destined to points in Silesia, giving a total consumption for the province of 11,736,144 tons (48%). Statistics taken or compiled from Statistik d. Oberschles. B. u. H. Ver., 1902, p. 62–3.

Silesia, of a total production in 1900 of 3,677,000 t., 1,386,000 tons was consumed in the district, and 957,000 elsewhere in Germany.[1] The question of the extent and importance of the local (monopoly) market is one of the most important facts to be determined in the analysis of the cartell system. Competition from outside regions under normal conditions is a negligible quantity.

The general or national market, on the other hand, is characterized by an absence of exclusive supply from any one source. This is most readily seen by taking the coal consumption of large cities removed from the sources of supply. Berlin is the most important example, and its sources of supply may be seen from the following table.:[2]

	Tons.
English coal, coke and brikets	410,327
Westphalian coal, coke and brikets	239,323
Saxon " " "	18,355
Upper Silesian " " "	1,681,325
Lower Silesian " " "	339,671
Total coal, coke and brikets	2,689,001
Bohemian brown coal and brikets	35,692
Prussian and Saxon brown coal and brikets	1,284,036
Total brown coal and brikets	1,319,728
Grand total, fuel of all kinds	4,008,729

Although Upper Silesia holds a leading position, the English and Westphalian producers supply a considerable portion, while the Saxon and Prussian brikets are even more redoubtable competitors. Munich shows an equally independent situation; her chief sources of coal supply are from the Palatinate and from the Ruhr, but the Saar and Austria furnish a respectable portion, while the latter furnishes a large supply of brikets.[3]

[1] Friedrich, p. 62; *cf.*, Sympher, p. 133.

[2] Statistik. Oberschl. B.-u.-H., 1902, p. 67.

[3] Railway receipts at Munich, 1902.

Origin.	*Steinkohlen.* Tons.	*Braunkohlen.* Tons.
Bavaria, Palatinate	285,768	95
Rhineland and Westphalia	163,603	----
Silesia	7,021	----
Province of Saxony	1,566	1,635
Saar	37,540	----
Kingdom of Saxony	3,311	2,024
Other German	1,704	----
Austria-Hungary	22,616	157,387
Great Britain	505	----
Other foreign	95	----
	523,729	161,141

Steinkohlenzechen, p. 119.

An examination of the figures of consumption of Leipzig would show the same general facts on a smaller scale, with a preponderance of brown coal in the ratio of more than 3 : 1.[1]

An examination of the domestic market requires something more than a view of the consumption of the cities, and we find that the different producing regions have a wide area of sale that overlap in many districts. The situation is clearly shown in the following tables for the principal regions. In 1899 the distribution of Ruhr coal in the domestic market was as follows:[2]

	Tons.
Westphalia and Rhine Province	27,519,441
Hannover and Brunswick	2,220,909
Magdeburg and Province of Saxony	624,789
Berlin and Province of Brandenburg	199,794
Thuringia and Kingdom of Saxony	488,820
Frankfurt and Hessen-Nassau	1,484,590
Bremen, Oldenburg and East Friesland	1,080,046
Hamburg, Schleswig-Holstein and Jutland	1,484,615
Lübeck, Mecklenburg and Danish Islands	196,706
Bavaria, Baden and Württemberg	777,569
Alsace and Lorraine	93,112
Total domestic	36,170,391
Total (excluding Rhineland and Westphalia)	8,660,950

[1] The principal sources of supply for Leipzig in 1902 were: Steinkohlen—Westphalia, 32,237 tons; Silesia, 71,491 tons; Saxony, 109,843 tons. Braunkohlen—Kingdom of Saxony, 214,301 tons; Province of Saxony, 187,326 tons; other German, 255,404 tons. *Zeitschr. f. Braunkohlen*, 1903, p. 387.

[2] *Dortmunder Jahrb.*, 1901, p. 570–1.

Ruhr coal has a specially wide market on account of its excellence and adaptability to various uses. The domestic consumption of Lower Silesian coal shipped by the main railways in 1902 was distributed as follows :[1]

Silesia	6,502,813	*Tons.*
Baltic ports (of East and West Prussia, Pomerania and Mecklenburg)	497,154	
North Sea ports (Hamburg, Bremen, etc.)	3,052	
East and West Prussia, Pomerania, Mecklenburg and Schleswig-Holstein	1,557,961	
Province Hannover	55,265	
Province Posen	1,465,047	
Berlin	766,280	
Brandenburg	785,582	
Government District Magdeburg	136,942	
Government District Merseburg and Erfurt	208,516	
Kingdom of Saxony	237,996	
Bavaria	18,639	
Westphalia	6,925	
Other Germany	3,780	
Total Germany	12,250,952	
Total Germany (excluding Silesia)	5,748,139	

The official statistics of the Saar give the domestic consumption in 1901 as follows : [2]

Local	2,717,710	*Tons.*
Other Prussia	2,081,355	
South Germany	2,378,240	
Alsace and Lorraine	1,245,512	
Total Germany	8,422,817	

The coke sales in the local and domestic market for the Dortmund district production in 1899 were as follows : [3]

[1] *Statistik. d. Oberschl. B. u.-H.*, 1902, p. 64.

[2] *Berg. Hütt. u. Sal.*, 1902, p. 100.

[3] *Dortmunder Jahrb.*, 1901, p. 570–1. More in detail, the distribution in the domestic market outside of Westphalia and the Rhine Province was :

Brunswick and Hannover	327,460	*Tons.*
Magdeburg and Province of Saxony	241,864	
Berlin and Province of Brandenburg	127,981	
Thuringia and Kingdom of Saxony	147,824	
Frankfurt and Hessen-Nassau	151,366	
Bremen, Oldenburg and Ost-Friesland	50,565	
Hamburg, Schleswig-Holstein and Jutland	95,770	
Lübeck, Mecklenburg and Danish Islands	36,129	
Bavaria, Baden and Württemberg	221,705	
Alsace-Lorraine	1,448,039	

	Tons.
Westphalia and Rhine Province	2,646,090
Other German	2,849,467
Total German	5,495,557

These tables show two things, first, that there are regions in which certain districts have a practical monopoly, and, second, that there are other competitive regions where two or more districts share the market. Unckell, a director of the Ruhr Syndicate, describes the boundaries of its non-competitive territory as follows: "The non-competitive region is bounded on the north by Holland, East Friesland and the Hamburg district, on the east by the province of Saxony, or more correctly, by the Elbe, on the south, we are met by Bohemian competition, and on the west by that of France and Belgium. It goes without saying that we have to reckon also with the competition of the Saar coal, but this is not so noticeable for us, inasmuch as the boundary of the non-competitive region must be drawn before reaching the Saar district."[1] The boundaries of the Upper Silesian non-competitive field have been described in a similar, if less precise, manner by Generaldirektor Bernhardi, one of the representatives of those interests in the recent inquiry. "The idea is widespread," says he, "that, because we are the second largest coal cartell, we were strong competitors of the Westphalian district. That is a great error. We compete only a very little with Westphalia; for there lie great buffer regions between the Upper Silesian and the Westphalian districts. We get beyond the Elbe only in exceptional cases; and where we have touched most sharply, as in the city of Berlin, it is rather an exception, and we do not compete there in a strict sense, be-

[1] Enquete, p. 70.

cause, besides ourselves, many other competitors are present. That is above all characteristic of the Upper Silesian sales that, in contrast to Westphalia, we rule without competition only in a very small district. This little district is only the province of Silesia, and, indeed, not unconditionally in Lower Silesia, because there rules a strong competition of brown coal, partly German, partly Bohemian, and perhaps also in the province of Posen, where, however, on the northern border, the competition of English coal comes into consideration".[1] The buffer region between Westphalia and Upper Silesia referred to in the foregoing is the brown coal district of central Germany.[2]

The third market that we have to consider is the foreign market and with that we may join the import trade. The figures for the Zollverein (Germany and Luxemburg) for 1902 are as follows :[3]

	Import. *Tons.*	*Export.* *Tons.*
Steinkohlen	6,425,658	16,101,141
Braunkohlen	7,881,986	21,765
Koks	362,488	2,182,383
Presskohlen, Torfkohlen, etc.	81,854	697,799

This table shows that Germany is decidedly more of an exporting than importing country. Reckoning five tons of Braunkohlen as equal to three tons of Steinkohlen, and assuming, as is warranted, that nearly all the Presskohlen are brikets, we have an import as compared with export of 3 : 5.

The question of import and export duties does not play an important rôle in the German coal trade. Neither Germany nor Austria levy duties on coal,

[1] Enquete, p. 326.

[2] Enquete, pp. 353–4.

[3] *Monatliche Nachweise*, etc., Dez., 1902, pp. 192–3.

and importation is free in England, Sweden, Belgium and Italy.[1] France, however, lays an import duty of 1.20 francs per ton,[2] and Russia from 2 to 3 marks per ton:[3] Between Germany and Luxemburg there is a Zollverein until 1950.[4]

The exports and imports of coal (Steinkohle) and coke for the principal countries trading with Germany in 1902 were:[5]

Country	Steinkohlen, tons		Coke, tons	
	Import	Export	Import	Export
Austria-Hungary	542,312	5,604,497	26,387	539,908
Belgium	496,083	2,217,419	176,385	176,042
France	6,343	980,967	55,179	703,528
Holland	171,755	4,540,955	185,100	
Italy	. .	37,479	. .	28,521
Russia	. .	586,565	. .	187,602
Sweden and Norway	. .	46,559	. .	41,245
Switzerland	. .	1,019,704	. .	125,802
United Kingdom	5,192,147	30,838	. .	15,733
Mexico	. .	. .	. .	113,192
Hamburg and Bremerhaven (Free ports)		901,221	82,058	4,260

The trade in Braunkohlen is practically confined to Austria; the imports from there were 7,881,986 tons and the exports 20,144 tons.[6] A view of these statistics will show that the most important export markets for Germany are Austria-Hungary, Holland, Belgium,

[1] Tariffs of foreign countries. Special consular reports. Vol. XVI.

[2] Perquel, p. 22.

[3] Friedrich, p. 49.

[4] *Stahl u. Eisen*, 1902, p. 1374.

[5] *Monatliche Nachweise*, Dez., 1902, p. 192.

[6] *Monatliche Nachweise*, Dez, 1902, p. 192-3. The trade in brikets, etc., though not so considerable, was more widely distributed. The imports were from Austria-Hungary. 73,042 t.; from Belgium 643,540, t.; from Holland, 74,699 t.; the exports were, to Austria-Hungary, 234,311 t.; to Belgium. 323,297 t.; to France, 173,728 t.; to Holland, 2,276,451 t.; to Switzerland, 3,715,406 t.; and the freeport of Hamburg, 57,026 t.

Switzerland, France and Russia. That is, Germany exports considerable quantities to her continental neighbors, but not much over-sea. The most important imports are Steinkohlen from England and Braunkohlen from Austria. In the case of Austria it is almost an even exchange (quality considered), while with England alone is Germany a debtor on account of fuel.

It is much easier to show the exports of the country at large than for the particular coal producing districts. Where cartells exist the export policy becomes one of peculiar interest and importance.

For the Ruhr syndicate the coal export in 1902 was as follows: [1]

Belgium	1,778,680 tons.
Denmark	76,100 "
France	440,335 "
Holland	4,163,156 "
Italy	84,659 "
Switzerland	165,863 "
Other countries	161,303 "
Total	6,870,196 "

The export of the Lower Silesian district in 1900 was: [2]

Poland	58,000 tons.
Hungary	4,700 "
Bohemia	1,041,000 "
Elsewhere in Austria	229,000 "
Total	1,334,000

The coal export of the Upper Silesian district (by main railways) in 1902 was as follows: [3]

Russia (excl. Poland)	9,072 tons.
Poland	619,824 "
Galicia, Bukowina, etc.	594,091 "
Hungary	556,315 "
Bohemia	506,708 "
Other Austria	2,791,483 "
Switzerland	30 "
Total	5,077,523 "

[1] Enquete, p. 280.

[2] Friedrich, 62.

[3] *Statistik Oberschl. B.-u.-H.*, 1902, p. 64.

The coal export of the fiscal Saar in 1901 was as follows :[1]

Luxemburg	45,985 tons.
France	359,832 "
Switzerland	532,125 "
Austria	16,273 "
Italy	2,530 "
Total	956,745 "

From a consideration of their geographical location it is evident that the districts of Upper Silesia, the Saar and Aachen are naturally directed to the exportation of a part of their production to the countries respectively adjacent to them. It is the same in a certain degree for the Bohemian brown coal with regard to some German markets. In most cases the consumer finds in them his necessary source of supply. In some cases, however, especially for English importations on the North Sea and Baltic, the producer in the importing country is a strenuous competitor. Hamburg, with its great coal demand for shipping is the chief seat of the contest on the North Sea where the English and Germans wage nearly equal war. The figures for 1902 are :[2]

English coal	2,792,822 tons.
Westphalian coal	1,773,800 "
Total	4,566,622 "

A similar rivalry exists in the Baltic between English and Upper Silesian coal. For sixteen of the chief ports the figures for 1902 are :[3]

Upper Silesian coal	2,055,105 tons.
English "	1,724,567 "

The exports of the Westphalian coke syndicate in 1902 were :[4]

[1] *Berg. Hütt. u. Sal.*, 1902, p. 100.
[2] Bericht d. Kohlen Syndicat, 1902, p. 12.
[3] Statistik Oberschl. B.-u.-H., 1902, p. 65.
[4] Enquete, p. 622.

France	710,870 tons.
Belgium	153,947 "
Holland	47,778 "
Switzerland	100,305 "
Italy	33,687 "
Spain	30,327 "
Austria	186,405 "
Russia	75 612 "
Sweden-Norway	54,043 "
America	183,895 "
Other countries	35,110 "
Total	1,611,979 "

For Upper Silesia the total coke production in 1900 was 536,000 tons, of which more than half was exported; to Austria 231,000 tons, and to Russia 61,000 tons.[1]

Another way to get a picture of the markets is to take the statistics of importation of the chief importing countries where the origin of the shipment is shown. For example, all the coal imported from Germany into Bohemia comes from Silesia; in the case of coke, however, of a total importation from Germany in 1901 of 329,309 tons, the Ruhr furnished 38,535 tons, and Silesia 246,439 tons. For Switzerland most German coal in 1901 came from the Saar, viz., 530,470 tons, while the Ruhr furnished 246,837 tons.[2]

[1] Friedrich, p. 63.

[2] *Cf.*, Van der Borght; *Conrad's Jahrb.*, 1903, III, F., pp. 175, 178-9.

CHAPTER III

TRANSPORTATION

The extent of the market for any given coal field depends largely on the means and costs of transportation, but here as in most other economic relations there is action and reaction, and the existence of a potential market may be the cause of developing means of communication by the construction of new routes or the adjustment of freight charges. In the Ruhr district, for example, the natural conditions are in favor of freight movements to the north and south, and in a less measure west, but the existence of a large market in Central Germany—particularly Berlin—has led to a demand for a midland canal. The railway rates, in Germany as elsewhere, are regulated not only with respect to the distance of the haul, but also with respect to the markets and the conditions of competition. In Germany, most of the railways are owned and operated by the government (state or imperial) and on the principle of profits; as compared with America, the charges are high.[1] Hence waterways have a special significance. In some respects Germany is well provided with this means of transportation; South Germany is connected with the great industrial region by the Rhine, Silesia with Berlin and Hamburg by the Oder, Havel, Elbe, etc., but the connections between east and west are deficient and the project of a great midland canal is still being debated. Local interests which would be put at a competitive disadvantage, or at least fear so, seem likely to prevent its accomplishment.[2]

[1] *Cf.*, *Cent. Verband D. I.*, 1901, p. 126.

[2] See Prusmann and Sympher. The Silesian industrial interests, as well as the Agrarians oppose it. *Cf.*, *Oppeln Hk.*, 1899, p. 4. *Industrie Ztg.*, 1899, p. 370. *Ztg. Oberschl. B.-u.-H.*, 1898, p. 399, etc.

The main waterways of Germany (*i. e.*, navigable by vessels of 400 tons) are: (1) the Rhine as far as Karlsruhe, (2) the Weser to Bremen, (3) the Elbe to Prag, (4) the Oder to Cosel; this is connected with the Elbe, (5) the Dortmund-Ems Canal, from Dortmund to the sea, at Emden, (6) the Kiel Canal.[1]

The topography of Germany is not sufficiently mountainous to offer any considerable obstacle to railway communication and, with an extensive railway network established, the principal problem in transportation is to get a favorable rate, and this forms a subject of unceasing discussion and negotiation between the shippers and the railway administrations. Special rates for coal are made to the principal competitive points and large markets; for example, from the Ruhr to Hamburg, to the Minette, to Siegerland, to Switzerland, etc., and from Upper Silesia to the Baltic ports and to the Russian border. The rates are systematically planned to favor the transportation of home products in competition with the foreigner; low export rates are allowed while import rates are made higher.[2]

The railway is the chief means of transportation for the coal and coke shipments of the Ruhr, as may be seen from the following statistics for 1897; (1) by rail from the mines to the Rhine ports (Ruhrort, Duisburg and Hochfeld) and thence by water—about 8,000,000 tons, (2) by rail to points on the left bank of the Rhine

[1] Sympher, Anlage 8. The secondary waterways are (1) the Weser between Bremen and Cassel; (2) the canal and river connection between the Oder, at Custrin, and Weichsel, at Bromberg; (3) the Marne-Rhein waterway running from Strasburg to Saarbrücken, Metz, etc.; (4) the Warthe, from the Polish border to the Netze; (5) the Main to Würzburg, and (6) the Saale, from Halle to the Elbe.

[2] For the very numerous special rates on coal and coke (some thirty-five in all) see Uebersicht ueber die auf den preussischen Staatseisenbahnen im Güterverkehr bestehenden Ausnahmetarife.

(*e. g.*, Luxemburg, Belgium, Holland, etc.,) and to South Germany—about 8,100,000 tons, (3) by rail to Hannover, Oldenburg, Anhalt and Magdeburg—about 3,150,000 tons.[1] The new Dortmund-Ems Canal has not changed the situation much; the shipments of all kinds of goods, seaward, in 1902 amounted to only 346,954 tons;[2] the coal interests claim that the rates are too high, but in official quarters it is explained on the ground of the newness of the enterprise.[3]

The coal mines of Upper Silesia are very unfavorably situated for transportation.[4] The Oder is improved, but the route is very unsatisfactory with droughts and floods,[5] so that, partly from this cause, partly on account of the importance of shipments to Austria, only a small portion goes by water. Thus in 1897 of a total sale of 20,706,000 tons, 14,482,000 tons were sent by rail and 1,077,000 tons by water.[6] Low railway rates are of great importance in order to compete with the English on the Baltic and to overcome the import tax on coal levied in Russia. There is often naturally a conflict of interest in the matter of railway rates between the different coal districts. Friedrich, for example, notices an attempt of the Ruhr producers to get a special rate to southwestern Bohemia —one of the markets claimed by Silesia; it was refused.[7]

The costs of transportation to the German markets

[1] Sympher, p. 27.

[2] *Bericht d. Kohlen Syndicat*, 1902, p. 10.

[3] Peters: Die finanzielle Entwickelung der preuss. Binnenwasserstrassen. *Archiv. f. Eisenbahnwesen*, 1902, p. 813.

[4] *Cf.*, Renauld, p. 44, *et seq.; Oppeln Hk.*, 1900, pp. 6–7.

[5] Enquete, p. 517.

[6] Renauld, p. 55.

[7] Friedrich, p. 64.

from foreign countries are often much less than for home producers. The English, from the location of their mines on the sea-coast in Yorkshire or Wales, can ship at small expense to the German ports. The current freight for Newcastle coal to those points is about 3½ shillings.[1]

From Hamburg, Stettin or Dantzig the rivers furnish cheap inland transportation. In the west, that is on the Weser above Bremen or on the Ems, English coal meets a strong competitor in the Ruhr, and does not penetrate far, but, as we have had occasion to observe elsewhere, it gets to Berlin. Ruhr coal, going to Berlin, generally goes first by rail to Hamburg.[2]

The Elbe furnishes an open door for the importation of Bohemian coal into Germany, which is found even in Prussian Saxony.[3] It finds a better market, however, in South Germany. Belgium occupies a favorable position for trade with the German industrial regions, but her own wants, as well as a greater cost of production and carriage, in most cases make the sales of coal relatively small. In respect to coke there is a definite pool with the Ruhr syndicate.[4] The transportation facilities between Germany and France are not specially favorable. The canalization of the Mosel and Saar is still a paper project. In spite of the French import tax the movement of coal is almost entirely westward. Russia cannot supply her own needs either, but draws revenue from the Silesian producers by the imposition

[1] *Glückauf*, July 4, 1903.

[2] Sympher, p. 6.

[3] Haacke, p. 32.

[4] See p. ooo below.

of duties on their trade across the border.[1] For the foreign market England is a dominating and ubiquitous competitor, with the United States appearing in the Mediterranean occasionally, as well as in trans-oceanic markets.

The following data as to rates will give some idea of the relation of transportation charges to the various domestic market points.[2]

Charges for Transportation to Berlin, 1898.

All Rail.	M.	*Rail and Water.*	M.
From Herne (on the Dortmund-Ems Canal, in the Ruhr district)	10.30	via Hamburg	9.60
From Königshütte (in Upper Silesia)	10.52	via Breslau and Poppelwitz	8.55
From Dittersbach (in Waldenburg district)	7.39	via Breslau	6.45

Charges for Transportation to Dresden (Rail and Water.)

From the Ruhr	7.50	(Good water)	6.30
From Lower Silesia	5.70		

Charges for Transportation to Sea Ports (all Rail.)

From Wanne (in Ruhr district,	to Hamburg[3]		5.50
	to Bremen	Domestic	5.50
		Export	4.70
"	to Papenburg	Domestic	4.30
		Export	3.80
From Königshütte (in Upper Silesia	to Stettin		7.53
"	to Dantzig	Domestic	8.98
		Export	8.21
"	to Königsberg		10.81

The transportation charges from the Ruhr to the Minette are :[4]

[1] The only non-European producer that could be considered with respect to German markets is the United States. With rates as low as 3–5 m. for eastward traffic, as they have sometimes been, American coal would be a possible competitor. (*Cf.* Aeltesten, 1901, p. 17). But the average cost of transportation is from 8–9 m., which puts it out of the question. *Cf. Coal Trade Journal*, 1902, p. 35.

[2] Sympher, pp. 135–6, Anlage, 11.

[3] The cost of transportation by the canal, including all incidental expenses, is reckoned at 5.20. Bericht d. Kohlen Syndicat, 1900, p. 11.

[4] *Stahl u. Eisen*, November 1, 1903.

	M.
Coal	8.30
Coke	7.80

One thing must be kept in mind constantly in figuring the market possibilities when the costs of transportation are given and that is that in modern industry, and above all in cartelled industry, the prices are made to suit the market to a large extent, and obstacles in the way of high transportation charges (as well as customs duties) are neutralized by a corresponding differentiation of prices.

CHAPTER IV

CAPITAL, ORGANIZATION AND LABOR

The question of the value of the coal properties is a difficult one to answer, but the following estimates may serve to give an idea of the matter at least in the case of the Ruhr. Taking, first, the quotation of the shares (Berlin) of thirteen corporations at the end of 1902, and comparing them with the par values respectively, we get a total value for the share capital of 507.2 million marks. The existing obligations of these companies are given as 68.1 millions, which makes a total value for these concerns of 575.3 millions marks.[1] These

Company	Capital, par	Quotation	Shares, market val	Obligations, par	Total value	Output 1000 t.
	M.		M.	M.	M.	
Aplerbecker . . .	2,400,000	90.50	2,172.000	1,064,500	3,236,500	205
Arenberg'sche . .	6,000,000	588.00	35,280,000	765,000	36,045,000	1184
Bergbau u. Schiff	7,000,000	122.00	8,540,000	1,240,000	9,780,000	327
Kölner Bgw. . . .	6,000,000	374.00	22,440,000		22,440,000	741
Concordia	8,000,000	283.00	22,640,000	1,154.000	23,794,000	884
Consolidation . .	16,000,000	353.00	56,480,000		56,480,000	1368
Gelsenkirchen . .	60,000,000	179.90	107,940,000	12,951,000	120,891,000	5089
Harpener	60,000,000	169.30	101,580,000	19,225,496	120,805,496	4875
Hibernia	39,400,000	178.20	70,210,800	10,952,000	81,162,800	3314
Königsborn . . .	9,000,000	134.50	12,105,000	5,250,987	17,355,987	728
Mülheim	15,000,000	88.75	13,312,500	5,530,010	18,842,510	998
Nordstern	20,000,000	248.00	49,600,000	8,323,900	57,923,900	2174
Rhein-Anthrac. .	3,900,000	126.10	4,917,900	1,691,000	6,608,900	229
	252,700,000		507,218,200	68,147,893	575,366,093	22116

mines produced 22.1 million tons of coal. Assuming a like relation of value and output for the whole district, we obtain by proportion a total value of 1514.4 million marks. This is probably somewhat too large, because the proportion of invested capital to output is greater in the large concerns than in the small ones, and they are also more profitable, and hence have a higher value per ton. No considerable error is involved in taking the bonds at par. Second we may take the market quota-

[1] Compiled from Saling, 1903–4.

tions of the Kuxe[1] of 46 Gewerkschaften at the highest bid for 1902 on the stock exchanges of Essen and Düsseldorf, and multiply them by 1000 (the number of Kuxe), which gives a total of 314.8 millions as the market value of the mines. In this case the indebtedness is not in all cases available and is left out; it is relatively unimportant. These Gewerkschaften produced 15.5 million tons in 1902.[2] Working out the

Company.	Highest bid, 1902.	Output 1000 tons.	Company.	Highest bid, 1902.	Output 1000 tons.
Bickelfeld	625	161	Gen. Blumenthal	15,500	842
Charlotte	365	80	Graf Bismarck	50,000	1134
Deutschland	2,050	260	Graf Schwerin	6,025	350
Freie Vogel, u. Unv.	1,400	143	Hamburg u. Franz.	3,725	561
Friedl. Nachbar	3,750	395	Heinrich	3,150	131
Gottessegen	4,850	143	Helene u. Amalia	15,000	728
Sieben Planeten	2,450	237	Hercules	6,825	366
Stock u. Scheren.	1,325	—	Joh. Deimelsburg	3,525	194
Trappe	2,390	124	Julius Philippe	610	225
Alte Haase	1,010	93	Kaiser Friedrich	550	137
Altendorf	1,000	114	Königin Elisabeth	15,200	661
Blankenburg	2,970	101	König Ludwig	13,750	577
Bommerbank	510	128	Langenbrahm	10,400	296
Borussia	1,625	152	Lothringen	14,050	479
Caroline	1,230	106	Mt. Cenis	12,750	665
Carolus Magnus	6,050	247	Portingssiepen	4,725	170
Constantine d. Gr.	15,900	875	Rudolph	610	—
Dahlhauser	2,450	142	Schür. u. Charl.	1,400	152
Dorstfeld	8,050	498	Tremonia	1,840	235
Eiberg	3,525	276	Unser Fritz	15,100	574
Eintracht	5,250	409	Victor	11,000	596
Ewald	22,700	852	Victoria	1,050	101
Friedrich d. Gr.	8,550	477			
Fröhl. Morgensonne	8,000	397	Total	106,165	4868

proportion, as before, we have a total calculated value for the Ruhr of 1177.9 millions marks. The first estimate is probably too high, and the second too low. If we assume the mean to be near the true value, we have

[1] See p. 34; Kuxe are shares without a nominal par; here 1,000 for each company.

[2] Data for first nine Gewerkschaften from Düsseldorf Hk., 1902, I, p. 164; rest from Essen Hk., 1902, I, pp., 72–6.

a total computed value for the Ruhr district of 1346.1 million marks (about $300,000,000).[1]

It is very generally remarked that coal mining is according to its nature a large industry.[2] But although the development of industry and wealth in Germany, especially in the last few decades has produced some large concerns, they do not either in industry or mining, in any case, perhaps, except Krupp, represent what would be called today an extraordinary aggregation of capital.[3] One reason for this is the organization of cartells, which have checked wide-reaching consolidations. Taking the cartells themselves, however, as industrial units, and this in many cases is quite admissible, the investment of capital under unitary control is sometimes very large and this is particularly true in the case of the Ruhr coal syndicate. If, however, we leave the syndicates out of the reckoning, the largest single coal producer in Germany is the Prussian fiscus. The Gelsenkirchen mining company produced 5,088,150 tons in 1902.[4] The eleven fiscal mines of the Saar produced 9,376,023 tons in 1901, and the three fiscal mines of Upper Silesia produced 5,305,910 tons in the same year, making a total of 14,681,933 tons from these two districts.[5] The other fiscal mines, mostly brown coal, may be omitted for this comparison. The large purchases in the Ruhr are but little developed.[6]

[1] For the mines of the Ruhr syndicate comprising 82.9% of the total output we may reckon a value of 1115.9 million marks (about $268,000,000).

[2] Arndt: Bergbau-u-Bergbaupolitik, pp. 4-7; Gothein: Sollen wir unseren Bergbau Verstaatlichen?, p. 19.

[3] *Cf.*, Schacht: Der Stahltrust, *Preuss. Jahrb.*, Juni, 1903.

[4] Steinkohlenzechen, p. 29.

[5] *Berg. Hütt. u.-Sal.*, 1902, II, pp. 68-125.

[6] *Cf.*, Verzeichnis, p. 7.

Before considering the various forms of mining associations and their importance a few points in the general mining law should be noticed. The right to mine coal is a regality or prerogative of the state according to Prussian and German law generally, with a few exceptions. A person on showing evidence that minerals exist may enter the lands of another, seek for the same, and mine them. One claim is limited to 2,189,000 sq. meters.[1] Of course there are numerous important police regulations, but the only one limiting the property interest of the owner of the claim, that we need notice here is, § 65 of the general mining law. (June 24, 1865) by which the owner of the claim is required to proceed with the proper exploitation of the mining land when called upon to do so in behalf of the public interests by the superior mining bureau (Oberbergamt).[2]

The mines may be distinguished according to ownership into four groups, (1) fiscal or state mines, (2) mines of private individuals, (3) Gewerkschaften, (4) Actiengesellschaften. We might add a fifth distinction—namely syndicate mines, but though economically valid it would scarcely conform to a legal classification of ownership. The fiscal mines require no explanation; they are simply mines owned by the State and run on business principles. The second group also explains itself. The Gewerkschaft, however, is of a more peculiar character, and is the usual form of organization. A Gewerkschaft is a legal person at German common law and is recognized by statute in Prussia and Saxony. There is limited liability, but there is no necessity for

[1] Arndt: Bergbau u. Bergbaupolitik, p. 26 *et seq*; the same, article Bergbau, Handwörterbuch der Staatswissenschaft, 1899, p. 548 *et seq*.

[2] X Commission, p. 19.

any subscription of capital to start the concern. Persons who wish to mine together may simply go ahead, with certain rules established for them regarding sharing the product, assessment for expenses and liability for debts. The property interests are represented by ideal shares (Kuxe) which stand for a certain fractional part of the whole; in Prussia formerly 1-128th, and then 1-100th, but now generally 1-1000th.[1] The larger mines are generally organized as Actiengesellschaften (A. G.), which are much the same as corporations in the United States.

Some of the mines in the Ruhr are owned by private individuals. Thus, until 1903, Friedrich Krupp and his successors owned three mines which now belong to the corporation bearing his name. The Haniels, Stinneses and Thyssens own several under the nominal form of a Gewerkschaft.[2] There are from about 90 to 100 mines in the Ruhr district organized as Gewerkschaften, mostly singly, but sometimes two are consolidated. The larger enterprises generally take the form of Actiengesellschaften and usually represent combinations of several mines. Thus Harpener includes 15 mines, Gelsenkirchen 9, Hibernia 5, Mülheim 4, Nordstern 3, etc. Quite a number are owned by iron and steel works and other large consumers of coal. This was the case, practically, of the Krupp mines, and is so today. The most important owners of this class are the blast-furnace companies who have in all about 21 mines; Gutehoffnungshütte 4, Union 3, Bochumer Verein 4, F. Krupp, A. G. 3, etc.

[1] Arndt: Bergbau u. Bergbaupolitik, p. 59; the same Handwörterbuch, pp. 552-3.

[2] *Cf.*, Verzeichnis, *passim*.

The situation in Upper Silesia is in some respects peculiar. Most of the coal property is in the hands of the nobility of the region, some of whom possess regalities. Their estates are often "majorats" or *fidei commisse*, and are, therefore, not in the market. It is said also they are not encumbered.[1] Of the sixty-three mines in the district thirty-six were owned by seven associations or estates.[2] The rest are scattered among nobility, burghers and companies, both Actiengesellschaften and Gewerkschaften.[3]

It is interesting to note that the nobility have increased their share positively and relatively during the last decade.[4] Four owners including the Prussian fiscus possess 51.2% of the total production in 1902.[5]

In the Waldenburg district a non-capitalistic system is said to prevail with most of the property in the hands of peasant Gewerkschaften.[6] The mines of the Saar, in Prussia, with one insignificant exception are owned by the fiscus. In the Aachen district there are only three important mines[7] which are closely allied.

In a thickly populated country such as Germany the

[1] Renauld, 52.

[2] Grafen Hugo, Lazy and Arthur Henckel v. Donnersmarck ---- 12
Fürst v. Pless ---------- 5
Kattowitzer, A. G. f. Bergbau u. Eisenhüttenbetrieb ---------- 5
Fürst Hohenlohe-Oehringen, Herzog v. Ujest ---------- 5
Königliche Preussische Staat ---------- 3
Ver. Königs u. Laurahütte, A. G. f. Bergbau u. Hüttenbetrieb ---- 3
Bergwerksgesellschaft v. Giesche's Erben ---------- 3

[3] *Cf.*, *Statistik d. Oberschel, B.-u.-H.*, 1902, pp. 24-26.

[4] *Cf.*, *Ztg. Oberschel, B.-u.-H.*, 1891, p. 151.

[5] Fiscus, 5,136,827 tons; v. Giesche's Erben, 2,660,432 tons; Kattowitzer, A. G. 2,426,329 tons; Königs u. Laurahütte, 2,410,439 tons. *Cf.*, Enquete, pp. 555-6.

[6] Gothein, p. 18.

[7] Steinkohlenzechen, pp. 73-5.

labor supply is, on the whole, plentiful and cheap. The total number employed in coal mining (Steinkohlen) in the Empire, in 1901, was 448,000,[1] of which 406,215 were employed in Prussia, distributed as follows:[2]

Mining district,	Breslau	104,295
"	Halle	46
"	Clausthal	3,556
"	Dortmund	243,926
"	Bonn	54,392

The distribution by age, sex and occupation for the important mining regions was as follows.[3]

	Regular miners	Other underground laborers	Men above ground	Boys under 16	Female	Total
Upper Silesia	44,152	11,618	15,144	2,120	4,149	77,183
Lower Silesia	12,234	4,434	6,303	797	339	24,107
Dortmund	119,130	67,267	42,290	8,082	----	236,769
Bonn	24,517	10,322	5,610	1,474	----	41,923
	200,033	93,641	69,347	12,473	4,488	379,982

It will be observed that only in Silesia is there a considerable number of female laborers. In the west a good many of the miners are immigrants, attracted by the relatively high wages. The Poles especially are drawn from the eastern provinces of Prussia.[4] Compared with the earlier type the modern miner is said to be of a lower grade;[5] the work has become more me-

[1] *Jahrb. d. Deutsches Reich*, 1903, p. 46.

[2] *B.-H. u. S.*, 1902, I, 54–5.

[3] *B.-H. u. S.*, 1902, I, pp. 30–3.

[4] The origin of the immigrants in the Ruhr are given as follows: Upper Silesia, 5,000; Posen, 1,800; East Prussia, 20,000; West Prussia, 6,000; Dutch and Belgian, 1,500; Italian, 1,400; Austrian, 3,400. *Abgeordnetenhaus, Protokoll*, 1900, Bd. I, p. 880.

[5] Oldenburg, 289; Schneider, 30. According to Dr. Tilly, the miner proper in the Saar prides himself on being a "königlicher Bergmann," and not a common laborer. *Kölnische Ztg.*, July 11, 1903.

chanical. One of the problems of the industry is to get a sufficient supply of labor, and to keep it. Since the demand for, and output of coal is subject to variations, the practice is to vary the time of operation rather than the number of persons employed.[1] When the wages are high and employment easily obtained the miner is not so steady in his labor. The mining interests of Silesia complain of the withdrawal of labor in the harvest season, and also of the attraction of mining labor to the Ruhr by the producers of that region.[2] One of the reasons given for the difficulty in meeting the demand for coal in 1900 was the great scarcity of labor.[3]

[1] Enquete, p. 258.

[2] Oppeln Hk., 1900, p. 11.

[3] X Commission, 1901, p. 20-21.

PART II

HISTORY OF THE COAL COMBINATIONS

CHAPTER I

HISTORY OF THE FORMATION OF COAL COMBINATIONS IN THE RUHR BEFORE THE SYNDICATES

When coal was first discovered and mined in Germany does not seem quite clear,[1] but at any rate it was not of any industrial importance until about the beginning of the nineteenth century. In the middle of the eighteenth century the production of Germany (excluding Austria) was 150,000 tons, and in 1800 it amounted to only 500,000 tons. In 1737 the Ruhr produced 30,000 tons, in 1800 about 200,000 tons.[2] The German coal industry was far behind the English not only in production and technique[3] but also in business organization.[4] Until the fourth decade of the nineteenth century almost all the mines of the Ruhr were worked by slopes or tunnels with natural drainage. Under such conditions a primitive, non-capitalistic system of mining prevailed, which gave no special advantage to large plants, and furnished little or no incentive to monopolistic combination.[5] The development of deep-shaft min-

[1] According to Oldenburg (p. 272) the coal industry in the Zwickau district dates from the tenth century, in Westphalia from 1302, in the Saar from 1529 and in Silesia from the seventeenth century; *cf.*, however, Fechner p. 469, Arndt, p. 11-12, Festenberg-Packisch, p. 67, etc.

[2] Oldenburg, pp. 272-3.

[3] Festenberg-Packisch, p. 64.

[4] *Cf.*, Cohn, pp. 206-226.

[5] Dr. Beumer, the well-known industrial writer, said recently in the Reichstag that a cartell existed in the Essen-Weidener district in 1827. Reichstag Protocoll., Nov. 4, 1902, p. 6136.

ing in the forties changed, in the course of a few years, the whole character of the industry. The rigid control of production by the state was largely removed in Prussia by the act of 1851 and almost completely by the act of 1865.[1] Improved technique and greater industrial freedom led to a great expansion in production especially in the Ruhr which in 1830 was only two-fold that of 1800, but in 1850 seven times as great. From 1850 to 1860 it increased from 1,665,662 tons to 4,365,834 tons per annum.[2] During the fifties there was a great deal of speculation and promotion which ended in the crash of 1858-9.[3]

It is at this point that the history of coal combinations begins, taking the word in its larger meaning, though it needed a score of years more before the first cartell was established. In 1858 the association for the mining interests of the mining district of Dortmund was founded,[4] which from that time on was conspicuous in its efforts to promote the interests of that region and, in particular, pursued the policy of combination with great tenacity. At that time it directed its energies to the promotion of the export trade in order to relieve the coal industry from the evils of over-production. Indeed at the time of its foundation it was far from the thought, then unfamiliar, of procuring any regulation of the market by interfering with free competition, and even as late as 1873, while denouncing such a policy as uneconomic, it denied that any effort of that kind existed among the producers of the district.[5] If such projects were foreign

[1] Oldenburg, pp. 273–4, Hundt, pp. 173–4.

[2] Schneider, p. 39.

[3] Oldenburg, pp. 274–5.

[4] Verein für die bergbaulichen Interessen des Oberbergamtsbezirk Dortmunds.

[5] *Jahresbericht d. Vereins*, 1873, p. 17.

to the purposes of the mine-owners in 1873, at the height of the boom, a marked change appeared in the next few years, when the newly blossomed German industry went through a severe ordeal. In a decade that marked the swing from free-trade to protection, it is not strange that the principle of free competition began to give place to the principle of combination. The raw iron industry had demanded and received protection; the coal industry had to take care of itself, and it saw only one course open—combination—both for maintaining the home market and for developing exports. Both policies were inaugurated in the same year. In 1877 the Westphalian Coal Export Association was established and the Berg and Mark Mining Company,[1] attempted to develop the trade to the East and to distant domestic markets.

In the same year the first definitely known[2] coal cartell was formed.[3] This provided for a temporary contraction of production (three months) of ten per cent. and included only certain sorts of coal mines.[4] This was not successful in producing the desired effect, although the agreement was enforced by a penalty clause and was duly kept. A similar but more elaborate effort was made in the autumn of 1879 and lasted about six months.[5] Although it also was not very successful, the principle found favor.

[1] Gruner et Fuster, p. 2 note; Sarter, p. 6; Huckinghaus, pp. 31–2; Steinmann-Bucher, *Ver. f. Soz. Pol.*, p. 215.

[2] There appears to have been some sort of a cartell in 1875 for 'long flame' coal. *Cf.*, Gruner, p. 17.

[3] To avoid a multiplicity of particular references a general reference is made here for the history of the formation of the coal cartels to Gruner, Huckinghaus, Sarter, Oldenburg and Steinmann-Bucher; authorities less easily available will be cited particularly.

[4] Kirdorf, *Cent. Verband, D. I.*, 1901, p. 223.

[5] *Bochum Hk.*, 1879, p. 8.

To properly appreciate the course of events, we must glance at the general industrial situation. The early seventies witnessed a tremendous industrial and speculative inflation which had been most pronounced in the coal and iron trades. Prices had risen very high and then suffered an equally marked collapse. The advance and decline in securities had been even more extraordinary. Purchasers of stocks in the boom period naturally suffered. Coal prices fell to a point that was below the cost of production for most mines and naturally far below the point of profit for those who had purchased them during the "*hausse.*"

The nature of the mining industry, when it assumes a highly capitalistic character, is such that the greater the production, the less the cost per ton. The prosperous years attract new investments of capital when profits are tempting, owing to decreasing costs and advancing prices, and when the lean years come, and prices fall, the hard times, instead of leading to a reduction of output (which would increase costs) lead to an increase of production which, of course, only aggravates the fall in prices and the general difficulty. The reason is that under a system of free competition no one mine can afford to limit its output—it would simply be playing into the hands of its rivals. Production must go on in order to pay some (even if an inadequate) return on the capital which is invested and which can not be withdrawn. Hence each mine tries to produce the greatest possible amount, hoping to gain something by increased cheapness of output, and recognizing that that part of the decline in price caused by its own contribution to the increase in output will be for it the lesser evil.

In 1880 a proposition was made by the management

of the mine Hannibal, looking either (1) to the establishment of a common selling bureau, or (2) a consolidation of the mines.[1] The time was not ripe for such measures; the individual operators were too little accustomed to co-operation for much less difficult undertakings. One step taken at this time which aimed to establish stronger bonds of union among them was the organization of a "Kohlen Klub" which played a considerable though inconspicuous rôle for the following decade.[2]

Agreements similar to that for 1880 were made in 1881, 1882 and 1883. They did not meet expectations though it would be too much to say, they were without effect.[3] The attempt to renew the agreement for 1884 on the basis of production equal to 1883 failed on account of the excessive demands of some mines, but the purpose was not abandoned. The market which had shown an improving tendency from 1881 to 1883 went off in 1884.[4] A rather elaborately organized cartel was formed in 1885 (including 91.52% of the output of 1884) providing for a contraction of production, with fines on excess production and premiums on deficiency. It did not succeed in restricting production. According to Oldenburg it broke down on account of complications with the newly formed coke cartell.

Meantime efforts had been made to remedy the evils by simple agreements as to prices. The first effort of this sort appears to have been in 1878 among the gas coal mines of Bochum and Gelsenkirchen, but it did

[1] *Bochum Hk.*, 1880, p. 6.

[2] *Cf.* Kirdorf., *Cent. Verband, D. I.*, 1901, pp. 223–4.

[3] *Bochum Hk.*, 1883, p. 6, etc.

[4] *Bochum Hk.*, 1881–1884.

not last long; equally futile attempts are mentioned for 1879 and 1884. So also the "Gasflamm" coal mines attempted price regulation unsuccessfully in 1881 and 1883. A more favorable result was obtained in both lines in 1887.

In 1882 the first attempt was made to regulate the minimum price of coke, which offered special advantages for this sort of a pool on account of its more uniform quality. This pool lasted one and a half years and proved profitable, but new technical developments disturbed the arrangements and the price agreement was evaded by rebates, etc., so that it broke down in 1883.[1] In 1885 the coke cartell was renewed for five years both as a price and production cartell under the name of the Association of Coke Works and "Fettkohlen" Mines of the Mining District of Dortmund. As Huckinghaus says they "took their task in earnest" and proceeded to establish a more solid combination than had previously existed, both as to the terms of agreement and the organization for putting it into effect.[2] The agreement had stipulated that 85% of the production should be included; as a matter of fact only 70% came in so that the combine was confronted with a formidable competition. A contraction of 30% was established and prices were maintained until the end of 1886 (though they were very low prices). But when it was seen that they were merely giving the outsiders a chance to increase production at their expense they removed all restrictions on production and price.[3] The immediate result was violent competition and a sharp fall in prices. The cartell continued in formal organization but did not

[1] See Statutes in Enquete, pp. 760–7.

[2] *Cf.*, *Bochum Hk.*, 1884, etc. Full text of agreement in Enquete, pp. 768–772; Gruner, pp. 17–22.

[3] *Bochum Hk.*, 1885, p. 9; 1886, p. 8.

attempt to perform the functions for which it was created. Coke fell from 7–7½ to 5–5¾ m. per ton.[1]

The cartells having failed to put the coal industry on a satisfactory basis, and the situation becoming rather worse than better, the Verein determined to see what could be done in another direction. The great waste involved in a multiplicity of small uncoördinated mines had already attracted attention in 1885, and the executive committee of the Verein appointed a commission to investigate the subject from technical and financial standpoints. The commission reported strongly in favor of extensive consolidation, and recommended that this be carried out on the basis of four regional groups. It was easy for the commission to prove that great economies could be attained by consolidation, and as a matter of fact the process had already begun in the case of individual managements, and, while the plan of the commission had no direct fruit, the systematic consolidations achieved by such mines as Harpen, Gelsenkirchen and Hibernia in the years immediately succeeding was almost equivalent.

Another promising effort which proved, however, unsuccessful and indeed illegal, was that by which a limitation of production was sought to be obtained by compulsory methods. There existed an institution known as the "Berggewerkschaftkasse," intended to promote the mining interests of the district, to which all mines were legally obliged to make contributions. The proposal now made and adopted was to levy these contributions on the proceeds from production above a certain amount.[2] The scheme was never actually enforced,[3] and the courts subsequently declared it illegal.

[1] *Bochum Hk.*, 1886, p. 8.

[2] Statutes given in part in Gruner, pp. 4–13.

[3] Kirdorf, *Cent. Verband D. I.*, 1901, p. 224.

The Verein pursued its aims in spite of failures. In 1887 the chairman, Dr. Hammacher, submitted a plan to the members for the establishment of a company which should have the sale of the entire Ruhr district in its hands. A commission of the Verein made a favorable report and proposed a detailed scheme of organization, the essential feature of which was the formation of an extraneous company with 25 millions capital which should make a contract with the mines for the exclusive sale of the product and for which the company should make stipulated payments. This plan failed to receive approval because the general opinion prevailed among the mine owners that they could do just as well without the help of the selling company.

The coke producers, fewer in number and with greater identity of interest, were more successful. The cartell already in existence, but *hors du combat*, did not satisfy them, and in 1887 a plan was formulated to organize a selling company composed of all the coke producers as shareholders with detailed regulations as to prices, etc. This plan received the assent of 90 per cent of the production in 1887, and continued under consideration till in 1888, when 97 per cent agreed to it under a modified form, and it was put in force. This cartell was too weak to meet the needs of the situation.[1] It lasted, however, until 1890, when the present coke syndicate was organized (September 22, October 16) with 92 per cent. of the production,[2] under the title Actiengesellschaft Westfälisches Cokssyndicat, and took over the sole sale of coke.

The period of deep depression of the middle eighties

[1] *Jahresbericht d. Vereins*, 1888, p. 19; for text of statutes see Anlage, III; also Enquete, pp. 778–81.

[2] *Jahresb. d. Verein*, 1891, p. 17.

was followed by a period of general improvement, rising prices and speculative activity. The mine owners had at last an opportunity to sell all they could produce. The mine laborers, however, who had their grievances also took this occasion to strike.[1] Over the cause of the strike we need not dwell long here; the immediate cause was dissatisfaction with the conditions of labor, particularly the length of the shifts; the underlying cause, according to Oldenburg, was the transition from middle-sized to large industry.[2] The government had to interfere to keep order and to reconcile the parties. It had two consequences to be noted here (1) it tended to strenghthen the movement of labor combination to oppose combinations of capital,[3] (2) it gave another impulse to the combination movement among the mine owners. Most of the coal mines of the district entered into a mutual insurance association for protection against loss through strikes (Feb. 13, 1890). One hundred mines representing 93.9% of the output of 1888 joined this society. The agreement provided for the payment of full compensation to those who suffered losses from strikes by no fault of their own.[4]

The next noteworthy step in the development of coal combinations came in 1890 and took a different direction. As the report of the Verein (1890, p. 7) says, it was seen that the time was not ripe for a general combination for the whole district. On the other hand local cartells might be formed and used as a basis for

[1] Schaeffle, Trennung von Staat u. Volkswirtschaft, p. 596.

[2] Schaeffle, *passim.*, Oldenburg, esp., p. 215; Denkschrift über die Untersuchungen der Arbeiter- u. Betriebs-verhältnisse in den Steinkohlen Bezirken. *Bochum Hk.*, 1888, pp. 11–18.

[3] Oldenburg, p. 215.

[4] For text of agreement see *Jahresbericht d. Verein*, 1889, p. 30, Anlage, V.

further combination. It seemed then that a few strong local cartells would be more serviceable than a weak general cartell. Carrying out this idea four local syndicates were formed embracing a large part of the production of the district. The first to be established was the A. G. Dortmunder Kohlenverkaufs Verein (Aug. 9, 1890) and the plan adopted was taken as a model by the local cartells subsequently formed, as well as the general cartell established three years later.[1] The plan was essentially similar to that of the coke syndicate established in the same year. The chief features were a selling company (Syndicat) composed of the coal producers who severally contracted to deliver their coal to the syndicate for sale receiving in return the proceeds therefrom. The mine-owners bound themselves to meet at regular intervals in order to make agreements concerning the amount to be produced and the prices for which the syndicate might sell it.[2] The Dortmund cartell included 3,000,000 tons; Harpener and Gelsenkirchen lying in the same district, though friendly did not join it.[3] A similar combination was formed soon after (Dec. 13, 1890) by mines in the Bochum district with an output of 4,000,000 tons. In the same month (Dec. 18, 1890) a third cartell was established at Essen with an output of 3,000,000 tons and finally at the beginning of the following year (Feb. 21, 1891) a fourth cartell embracing the mines of the Steele-Mülheim district with a production of about 1,000,000 tons was formed.[4] These four cartells together with the allied Harpener and Gelsenkirchen mines included about 75% of the output.

[1] Kirdorf. *Cent. Verband D. I.*, 1901, p. 225.

[2] For text of cartell, see Gruner, pp. 40–51.

[3] *Bochum Hk.*, 1890, p. 8.

[4] Gruner, p. 51; *Bochum Hk.*, 1890, p. 8.

One other cartell was formed at this time which requires a passing notice, namely, the Briket Verkaufsverein (Jan. 10, 1891). It soon came to embrace the whole output of the district. Its organization was similar to the Dortmund cartell described above.[1]

The *hausse* of 1889–90 proved to be of short duration; the new cartells had been formed just at the end of it, but they were not strong enough to prevent a rapid decline in the price of coal, though this does not show itself distinctly in the business of the mines, owing to the length of the terms of previous contracts. The reports of the Verein and of the Bochum chamber of commerce attribute a moderate success to them.[2] As long as the industry was organized in local cartells, it would seem, indeed, *à priori*, that the result would be an increase rather than a decrease in competition, and to a certain extent this appears to have been true. To remedy this danger a tentative step towards a more general combination, an association called the "Gemeinschaft," was established, Jan. 16, 1892, to which the four local cartells described above were signatory parties, together with twenty-four of the most important coal mines of the district, representing a production of about 31,000,000 tons, or over six-sevenths of the total output of the district. The organization was weak and attempted principally to get a harmonious determination of prices through meetings composed of producers of the different sorts of coal, the conclusions of which were subject to the ratification of the general assembly.[3] It was dissolved in Sept., 1892, before the term of the agreement had expired.

[1] *J. d. Verein*, 1891, p. 20; Gruner, p. 52.

[2] *Verein*, 1891, pp. 14–17; *Bochum Hk.*, 1891, p. 8.

[3] *Cf.*, Gruner, p. 53–5. *Bochum Hk.*, 1891, p. 8; 1892, p. 6.

In the meantime negotiations were being conducted with the aim of establishing an effective combination such as had already been achieved for coke. This was finally accomplished at a meeting held on January 22, 1893. Of the total production of the district 96.94 per cent. was considered eligible, but they succeeded in bringing in only 86.8 per cent.[1] This cartell established a selling company which took the title "Actiengesellschaft Rheinisch-Westfälische Kohlen-Syndicat." It was organized on a plan substantially the same as the Dortmund cartell of 1890; the details are given below.[2] The production of the Dortmund mining district in 1892 was 36,853,502 tons[3]; the production of the mines joining the syndicate for the same year was 31,975,642 tons[4]; their estimated capacity (1893) according to the syndicate treaty was 33,575,976 tons[5]. Thirty-one mines, mostly very small, with a total production of 1,254,945 tons did not come in (Mt. Cenis, production 198,934 tons. came in shortly after), and besides these there were "smelter mines" (Hüttenzechen) with a capacity of 3,777,158 tons.[6]

The establishment of this cartel made several of the existing combinations superfluous, and they almost all disappeared before the end of 1895. This does not apply to the cartells of coal products, viz., coke and brikets, which have continued with very close relations to the coal cartell down to the end of 1903.[7]

[1] Kirdorf, *Cent. Verband D. I.*, 1901, p. 225.

[2] See p. 78.

[3] *Berg.-Hüt. u. Sal.*, 1894, p. 2.

[4] *Ztg. d. Oberschl. B. u. H. Vereins*, 1893, p. 18.

[5] *Bericht d. Rh.-Westf. Kohl. Synd.*, 1902, p. 6.

[6] *Ztg. d. Oberschl. B. u. H. Ver.*, 1893, p. 18.

[7] *Cf.* Gruner, pp. 76–7.

CHAPTER II

OTHER COAL CARTELLS

Coal combinations, though they exist in other parts of Germany, have no such history as those of the Ruhr. The most important—that of Upper Silesia, founded in 1890, kept its operations so much from the public eye that some of the best informed writers seemed to be ignorant of its existence years after its formation.[1] Yet it was known to Grossmann in 1891[2], and is mentioned in the annual report of the Breslau Chamber of Commerce in 1893.[3]

An association for the advancement of the interests of the mining and smelting works of the region was formed on the model of the Ruhr Verein in 1861.[4] This apparently satisfied the demands for combination, until the end of the eighties, and, considering the small number of producers and their social character, it is comprehensible that that might have been enough to procure a fairly good observance, tacit or expressed, of price agreements, etc. In 1888, however, a cartell was attempted, on the plan of the Kali Cartell, to include

[1] *Cf.* Renauld, [1900] "Von Oberschlesien ist nur ein Versuch zu einer Koalition in Jahre 1887 . . . . bekannt, der an der Ablehnung des Beitritts der fiskalischen Werke scheiterte," p. 182, note.

Friedrich, (1902), apparently knew the situation, but conceals it in a vague sentence. "In Oberschlesien kam jedoch eine Koalition der Kohlenwerke nicht in dieser Form" [*i. e.*, Ruhr Syndicate] "zu Stande," p. 66.

[2] Grossmann : Ueber industrielle Kartelle. *Jahrbuch f. Gesetzgebung* etc., 1891, p. 240.

[3] *Jahresbericht der Handelskammer zu Breslau* für das Jahr 1893, p. 234.

[4] Oberschlesien berg- und hütten-männischen Verein, 1861. *Cf.* Verzeichnis der im Deutschen Reiche bestehenden Vereine gewerblicher Unternehmer. Berlin, 1903.

the fiscal mines, but failed on the refusal of the state to participate. It was accomplished in 1890 without them.[1]

The cartell in the present form dates from 1898, and is called the Oberschlesische Kohlenkonvention.[2] It was reported in the beginning of 1901, and even positively affirmed, that there was a movement towards the establishment of a so-called syndicate, and that the fiscal mines were the chief promoters of the project. At any rate it came to nothing.[3]

Since the production of the Saar is practically consolidated in the hands of the Fiscus, a cartell would have no meaning.

For the mines of the Waldenburg district (Lower Silesia), a Verein like that in the Dortmund district has existed since 1876.[4] There does not appear to have been any cartell, however, until within about a year. The *Industrie Zeitung* for May 16, 1902 reports the establishment of a selling syndicate called the Kohlenverkaufs-syndikat im Waldenburger Revier, which includes all the mines of the district and one Neuroder mine; this cartell has a term of five or six years, and does not include coke.[5]

In Saxony a Verein for mining interests in the Zwickau district was established in 1860.[6] A cartell seems to have been in operation for a part of this district for a good many years. (1885).[7] On April 1,

[1] Grossmann, p. 240.

[2] *Cf.* Enquete, p. 539. For detailed description see p. 104.

[3] *Industrie Zeitung*, 3 Jan., 1901, p. 3. 10 Jan. 1901, p. 16.

[4] Verzeichnis der im Deutschen Reich bestehenden Vereine gewerblicher Unternehmer, p. 96.

[5] *Industrie Zeitung*, May 16, 1902; *Cf.* Grunzel, p. 291.

[6] Verein für bergbauliche Interessen zu Zwickau i. S. *Cf.* Verzeichnis der im Deutschen Reiche bestehende Vereine etc., p. 97.

Enquete, p. 599.

1902 a production cartell called the "Zwickau-Oelsnitz-Lugan Convention" went into operation. The form is peculiar. A minimum price is fixed and the market is divided into three zones; in the first, where no outside competition exists no reduction is allowed, in the second, the price may be cut, but not over four marks, and in the third there is no limit placed on price-making.[1]

The brown coal industry has had a Verein since 1885—the "Deutsche Braunkohlen-Industrieverein";[2] and similar organizations exist for local interests, viz., Niederlausitz (1898), Magdeburg (1879), Rheinland (1893), Dresden (1898), and Leipzig (1895).[3] A cartell was established Nov. 20, 1896 for brown coal in the Magdeburg district which expired on Dec. 31, 1899, and was reorganized for five years.[4] Another brown coal cartell was formed in Saxony.[5] One of the most important of the brown coal cartells is the "Braunkohlen-Brikets-Verkaufs Verein" in Cologne; this cartell has been in operation several years, but was reorganized under the present title in 1902. Some of the provisions of its treaty are noteworthy. Section six of the treaty provides that briket works cannot manufacture brikets with special label or brand to more than 50% of the total allowance; the rest are marked "Union." The special brands, further, must be sold at a higher price (by 10 m. per 10 tons), and the purchasers must agree to accept the "Union" brand in lieu of the same, if it is deemed necessary by

[1] *Cf.* Sayous, pp. 277–8.

[2] Verzeichnis der im Deutschen Reiche bestehenden Vereine etc. p. 97.

[3] *Ib.* pp. 97–8.

[4] Grunzel, p. 292; *Industrie Ztg.*, July 6, 1899, and "middle of January" 1898.

[5] Grunzel, p. 292.

the cartell in order to keep the works uniformly occupied.[1]

We may mention here also the existence of cartells in the by-products of the coal industry, namely, the "Deutsche Ammoniak-Verkaufs-Vereinigung"[2] (Bochum) which has been in operation since 1896, and has today 29 members, besides selling agencies for gas works in seven cities, etc.[3]; The Deutsche Theer-Verkaufs-Vereinigung which has been in operation since 1898, and includes 24 members; and the Westdeutsche Benzol-Verkaufs-Vereiningung which includes twenty members.[4]

[1] *Cf.* Cartell treaty in Laur, pp. 304-18.

[2] Gruner, p. 77; *Bochum Hk.*, 1901, p. 121.

[3] *Steinkohlenzechen*, 1903, p. 110.

[4] *Id.* 1903, pp. 111-113; *Bochum Hk.*, 1901, pp. 124-5.

CHAPTER III

HISTORY OF THE OPERATION OF THE COAL AND COKE SYNDICATES OF THE RUHR

Even more important than the history of the formation of the cartells is the history of their operation. Both on account of the nature of the material available and the importance of their affairs the coal and coke syndicates of the Ruhr present the best field for study.

In the following pages we shall treat of them according to this order, (1) the operations of the coke syndicate from 1890 to 1895, (2) the beginnings of the coal syndicate, 1893–1895 (3) the operations of the coal and coke syndicates from 1895 to 1900—the *hausse* period, (4) the coal famine and the crisis—1900, (5) the coal and coke syndicates during the hard times, 1901–1902.

The Coke Syndicate 1890–1895. The coke syndicate was established on Sept. 16, 1890, and shortly after its organization it embraced 98.5% of the output of the district excluding smelter coke-works.[1] At that time German industry had just reached the end of a short but vigorous boom. The iron trade—the barometer for coke production—had been enjoying a large business at profitable prices, and coke prices went up with them. The average Dortmund price [2] for Bessemer iron in 1890 was 79.8 m., and Thomas iron 61.0 m., while blast furnace coke had been up to 29.75 m. in February, and averaged 19.78 m. for the year.[3] The market was not so strong as it looked from current prices, and this undoubtedly led the coke syndicate to adopt a very

[1] Extracts from Memoirs of the coke syndicate, in *Dortmunder Jahrbuch*, 1901, p. 554.

[2] *Vierteljahrshefte*, 1902, p. 20.

[3] *Essen Hk.*, 1902, I, p. 71 ; 1890, I, p. 33.

moderate policy at the start. At any rate blast furnace coke was sold at 13.50–14.00 m. for the rest of the year.[1] The official price (Verrechnungspreis, see p. 000) was fixed at 13.00 m.[2] Owing to the existence of previous contracts, the syndicate did not get control of the situation until the following year.

The period from 1891–5 may be summed up as follows: The iron trade showed great weakness; although there was a steady increase in production (from 4,641,217 tons in 1891 to 5,380,038 tons in 1894[3]) prices fell decidedly; in 1891 Bessemer was 62.1 and Thomas 49.5, and by 1895 they had dropped to 52.0 m. and 45.6 m. respectively.[4] Until 1894 a heavy depression existed in the raw iron trade.[5]

The coke syndicate, as said above, really began work in 1891; its production in that year was 2,855,000 tons, out of a total production for the Ruhr district of 3,937,773 tons.[6] In order to meet the demand, a considerable contraction of the theoretical capacity was required. In the following years the production increased steadily, and in 1894 reached 4,736,195 tons,[7] although a contraction of production existed each year, (13% in 1892, in 1894, only 5%).[8]

The average prices of blast-furnace coke corresponded with the official prices of the syndicate; 13.50 m. in 1891, 12.00 m. in 1892, and 11.00 m. for the two follow-

[1] *Essen Hk.*, 1890, I, p. 33.

[2] Enquete, p. 793.

[3] *Stahl u. Eisen*, 1902, p. 341.

[4] *Vierteljahrshefte*, 1902, I, p. 20.

[5] Kestner, Die deutschen Eisenzölle, p. 41.

[6] Rept. of syndicate in *Bochum Hk.*, 1891, p. 11.

[7] *Id.* 1894, p. 11.

[8] *Id.* 1892, p. 9; 1894, p. 11.

ing years.[1] The reductions made were concessions to the iron trade which complained of the high coke prices although the fall in iron prices was proportionately less. The coke producers, besides lowering the domestic prices, were forced to seek outlets in an increased export trade at low prices.[2] In order to stimulate the home consumption, recourse was had in 1892 to a system of export bounties paid to the raw iron producers of Siegerland at the rate of 1.50 m. per ton of exports.[3] The establishment of the coal syndicate in 1893 helped to strengthen those mines belonging to the coke syndicate, as well as to improve the general tone of the market. Another very important event was a deal with the Belgian coke syndicate providing for a division of the field—chiefly in the foreign market. The coke production of the Aachen district was practically merged with that of the Ruhr.[4]

The Beginnings of the Coal Syndicate. The Rhenisch-Westfälische Kohlen Syndicat began operations formally on March 1, 1893, but it did not undertake the sale of coal until August 1 of the same year, and, as most of the product was already contracted for, the first year permitted it to do very little business beyond administrative organization. The sales for the year were only 2,769,077 tons, while the amount shipped by the syndicate mines was 8,643,853 tons.[5] The only influence the syndicate could exercise was through the contraction of production; the projected contraction was 15%,[6] the

[1] *Essen Hk.*, 1902, I, p. 71.

[2] *Bochum Hk.*, 1892, p. 7.

[3] *Id.* 1892, p. 9; 1894, p. 11.

[4] *Id.* 1894, pp. 8–11.

[5] Rept. of syndicate in *Essen Hk.*, 1893, II., p. 8.

[6] *Bochum Hk.*, 1893, p. 7.

actual contraction only 12%.[1] The syndicate got a good reception from the start from its customers.[2] This was due largely to its price policy, the moderation of which allayed their fears. This moderation was partly a necessity owing to the unfavorable market situation, but also intentional.[3] The prices were undoubtedly quite low. The average annual quotations on the Börse in Essen for the principal sorts, run of the mine, were as follows,[4]

	Gas	*Gasflamm*	*Fett*	*Mager*
1893	9.79 m.	7.58 m.	7.29 m.	7.50 m.

These were considered inadequate even by the moderate element.[5] In comparing prices, it will be convenient to use the Essen prices above quoted, and also the standard prices or price norms (Richtpreise, see p. 83) which are the basis for price making by the syndicate. Some of these norms at this date were, Fettkohlen (run of the mine) Fettförderkohlen 7.00 m., Gasflamm förderkohlen 8.00, m., Fett-Nuss I, 10.50 m., Kokskohlen (coking-coal) 5.50 m.[6]

The second year of the coal syndicate (1894) gives a better picture of its activity and functions. The industrial and produce market remained unfavorable, although there was a general advance in the stock market.[7] The coal stocks in particular advanced decidedly, which was unquesitonably due to the successful operation of the syndicate. That the syndicate operated success-

[1] *Cent. Verb. D. I.*, 1901, p. 229.

[2] Rept. of syndicate in *Essen Hk.*, 1893, Th. II., p. 9.

[3] Effertz, 1894, p. 5.

[4] *Essen Hk.*, 1902, I., p. 71.

[5] Kirdorf. *Cent. Verb. D. I.*, 1901, p. 234.

[6] Denkschrift, Anlage 2.

[7] *Dortmund Hk.*, 1894, p. 12; *Bochum Hk.*, 1894, p. 5; *Essen Hk.*, 1894, p. 12.

fully from a stock market point of view was evident from the course of prices. The price norms had been advanced from .50 to 1.00 m. per ton[1], while the quotations on the Essen Börse showed a corresponding gain. These prices, however, by no means represented a completely satisfactory scale in the minds of the coal producers. Effertz, in his *brôchure* in 1895, declared that in the preceding year about half of the mines worked without profit.[2]

The first annual report of the syndicate gives some interesting details of the organization of the new company. The selling business was divided into seven departments, according to the kind of coal, with a staff of one hundred eleven employees. There were also departments for book-keeping, statistics, administration, etc., and a body of legal counsellors, in all two hundred thirty-seven persons. A building for its use was supplied by the city of Essen.[3]

As a good many of the contracts previous to the establishment of the syndicate did not expire till April 1, 1894, the syndicate did not sell much the first three months (16.94%). At the inauguration of the syndicate, on Mar. 1, 1893, the total participation figures, or ideal capacity of the syndicate, had been fixed at 33,575,976 tons, but at the beginning of 1894 it had increased by 5.81% to 35,531,116 tons, and at the end of that year stood at 37,988,233 tons. The syndicate established a check on a too rapid increase by a contraction of the output. The projected contractions, fixed from time to time, amounted to 11.75% of the capacity,

[1] Denkschrift, Anlage 2; see p. 000.

[2] Effertz, 1895, p. 15; *cf.*, also, Kirdorf, *Cent. Verb. D. I.*, 1901, p. 234.

[3] Rept. of syndicate in *Essen Hk.*, 1894, II., pp. 5–7.

but the actual contractions really amounted to much less, namely 4.98%. As the annual report remarks, "the power of restraining production possessed by the syndicate is of a temporary character, and it is impossible to permanently limit the productive capacity." The organization and control of the coal trade was begun at this time.

The Coal and Coke Syndicates during the Hausse. The year 1895 marked the welding together of the coal and coke syndicates,[1] and a prolongation of the term of the former until 1905. The alliance of the two syndicates did not destroy the identity or individual policy of either of them, but it centralized and simplified the duties of administration and sale, and brought them into an organic connection more nearly corresponding to their community of interests. The Briket-Verkaufs-Verein was attached to the coal syndicate at this time also.

The period of 1895-99, inclusive, had a distinct unity as a period of very rapid development in German industry, particularly in coal and iron, and one which was marked by a strong advance in prices, culminating at the close in remarkable speculative activity, and brought to an end by the crisis of 1900.

For the coal and coke trade, the position of the iron industry was of critical importance, and the main facts in the situation are shown in the production and prices of raw iron. The iron production of 1895 was 5,464,501 tons, and thereafter it showed a prodigious and uninterrupted increase until 1899, reaching in that year a total of 8,143,132 tons.[2] The average price of Dortmund Bessemer iron was 52.0 m. in 1895, and Thomas iron was 45.6 m.; the average annual prices increased

[1] See p. 000.

[2] *Stahl u.-Eisen*, 1902, p. 341.

steadily, and in 1899 were 65.4 m. and 58.5 m. respectively.[1]

The coal production of Germany, also, showed a very large increase in this period, advancing in round numbers, from 79,169,000 tons in 1895 to 101,640,000 tons in 1899;[2] the corresponding figures for the Ruhr district were 41,734,000 tons and 55,072,000 tons. The coal syndicate kept pace with the general movement, producing 35,347,000 tons in 1895, and 48,024,000 tons in 1899.[3] The production, however, did not equal the productive capacity, as measured by the allowances of participation,[4] which amounted, in round numbers, to 37,988,000 tons at the beginning of 1895 and 53,559,000 tons at the end of 1899, but the steady improvement of the coal market made it possible to reduce and finally to abolish the restrictions imposed on production, in 1895, 12.08%, in 1899, 3.75% for the year (with free production during the last three months) though the mines, generally were allowed to produce more than was planned in the first part, and in 1899, when production was practically free, they were unable to equal their supposed capacity.[5] The demand, in fact, exceeded the productive power, and the country was confronted with a scarcity of coal (Kohlennot).

The advance in prices was as decided, if not as great, as the increase in production, and this could hardly have been otherwise, even if there had been no coal syndicate, when the character of the market is taken

[1] *Vierteljahreshefte*, 1902, I, p. 20. Thomas iron shows a small decline in 1898, but puddled iron an increase.

[2] *Stat. Jahrbuch*, 1903, p. 46.

[3] *Bericht d. Rh. W. Kohlen-Synd.*, 1902, p. 11.

[4] *Id.*

[5] Reichstag, 1902, p. 6139.

into account. The average annual quotations on the Börse in Essen for the principal sorts of coal, run of the mine, were[1]

	Gas	*Gasflamm*	*Fett*	*Mager*
1895	10.13 m.	8.33 m.	8.00 m.	7.50 m.
1899	11.75 "	9.13 "	9.37 "	8.88 "

With the exception of Gasflammförderkohle in 1896, these advances were uninterrupted for the annual average. The advances in market quotations followed naturally from advances in the price norms. As typical of these we may cite:[2]

	1895	*1897*	*1899*
Gasflammförder,	8.50 m.	9.25 m.	9.75 m.
Fettförder,	7.50 m.	8.60 m.	9.10 m.
Fett-Nuss, I	11.00 m.	11.00 m.	11.50 m.
Kokskohlen,	6.50 m.	7.00 m.	8.50 m.

The price advances were defended, irrespective of market conditions, by the fact of increasing costs, and it was claimed, not without reason, that if the syndicate had not existed, the prices would have advanced more rapidly and higher. The moderate party in the syndicate appears to have had control up to 1898, when after a sharp and somewhat acrimonious struggle in the general assembly, the radical party won the day.[3] The autumn of 1899 brought another struggle in which the radical party again won the victory and made a price advance which did not take effect, however, until the following year. Those who had defended the cartell *régime* both in coal and other products, as being a guarantee of a moderate price policy and steady prices, found this somewhat radical movement unwise and injurious. The Bochum chamber of commerce, for ex-

[1] *Essen Hk.*, 1902, I, p. 71.

[2] Denkschrift, Anlage 2.

[3] *Cf. Cent. Verb. D. I.*, 1901, p. 235. Herr Kirdorf, the chairman, called the "apostle of moderation," was accused of a careless neglect of the interests of the cartell.

ample, raised a warning cry against excessive price advances, at the same time defending the cartells generally and in principle.[1]

Just at the close of 1899 a coal famine appeared which lasted into the following year and may be better described there. The insatiable demand led the syndicate not only to remove all restrictions on production, but also to cut down its exports which actually showed a decrease during the year 1899 in spite of a good demand.[2] Even then it had to buy coal abroad in order to fill all its contracts.[3]

The history of the coke syndicate for the period 1895-99 is in the main lines the same as the coal syndicate. Even more than the coal producers, the coke producers depended for their prosperity on the situation of the iron trade, and it was precisely during this period that the German development of iron production assumed such proportions as to attract the attention of the whole commercial world. Only in one year, 1898, was there any evidence of weakness, but this was followed by a strong recovery.

For the production of coke in Germany, the Ruhr district is decisive; this had increased, in round numbers, from 5,563,000 tons in 1895, to 8,202,000 tons in 1899.[4]

[1] *Bochum Hk.*, 1898, p. viii, (written in 1899). "Wenn in letzter Zeit die Preise vielfach sehr stark und stellenweise wohl auch uebermässig heraufgesetzt worden sind, so ist das sehr bedauerlich, und wir gehalten uns für verpflichtet, hier warnend unsere Stimme zu erheben; aber wir meinen doch, eine schwere Anklage deswegen gegen das gesamte deutsche Kartellwesen zu schleudern, ist nicht angängig, denn darüber kann im Ernst doch auf keiner Seite ein Zweifel bestehen, dass ohne den mässigenden und regulierenden Einfluss dieser Verbände die Entwickelung viel überhasteter vor sich gegangen und die Preissteigerung eine viel stärkere gewesen wäre, so dass wir uns schon längst in einer schweren Krisis befinden würden."

[2] Rept. of syndicate in *Essen Hk.*, 1899, II, pp. 6-11.

[3] *Bochum, Hk.*, 1899, p. 52.

[4] *Dortmunder Jahrb.*, 1901, p. 581.

Of this the coke syndicate had produced 4,821,787 tons, or 86.7%, in 1895 and 7,045,923 tons, or 85.9%, in 1899.[1] The slight decline in the proportion of the syndicate was due to the increase of the coke plants of the independent smelter mines (Hüttenzechen).[2] The production of iron in Germany and Luxemburg increased between 1895 and 1899 about 49%, while the production of the coke syndicate increased about 46%. The market of the coke syndicate, however, was not coterminous with the region of iron production of Germany and Luxemburg, and it would be difficult to delimit its normal field of supply. That there was no decided attempt to restrain production appears from the fact that the proportion of the syndicate output did not materially diminish, and also because the contraction of productive capacity was not great during any year of this period.

The course of coke prices on the Börse in Essen shows a steady increase from an average of 11.00 m. for blast furnace coke in 1895, to 14.37 m. in 1899.[3] These corresponded to normal prices of 11.00 m. and 14.00 m. respectively.[4]

During this period there was great steadiness in price, but a considerable fluctuation in activity in producing and marketing coke. Thus in 1895 a restriction was imposed as high as 19% in the earlier months of the year, while at the end the ovens were run to their full capacity.[5] On the other hand, in 1897 the coke syndi-

[1] *Dortmunder Jahrb.*, 1901, p. 581.

[2] *Cf.* Reports of coke syndicate.

[3] *Essen Hk.*, 1902, I, p 7.

[4] Enquete, p. 973.

[5] Report of syndicate, 1895, in *Bochum Hk.*, 1895, p. 9.

cate bought coke in England in order to fill its orders.[1] The most eventful year was 1899 which is described as being extraordinarily lively for the iron trade[2] with great scarcity of coke. Coke production was unrestricted throughout the year, but the demand was so great that it gave speculative dealers a chance to run up the prices. In order to prevent them from exploiting the consumers unfairly, the syndicate extended its direct sales to all who took a minimum of 500 tons per annum.[3]

Another very important event in 1899 was the formation of the so-called two year fusion contracts. The practice of making contracts of sale long in advance of the period of production had led the coke syndicate to sell its output for 1900 in the spring of 1899, and indeed, at the price of 14 marks then prevailing. The energetic demand for coke led the radical element to think that they had sold altogether too cheap, and a movement was put on foot to practically cancel these contracts and to substitute a two year contract (*i. e.*, for 1900–1901) with a price of 17 marks. On the principle of charging what the market would bear, the price of 17 marks appeared fairly moderate in the fall of 1899, but many of the iron manufacturers did not like the idea of a two-year contract, nor were they anxious to give up their favorable contracts at 14 marks for 1900.[4] The coke syndicate in its report for 1899 says: "The security of the coke supply united with the unitary determination of a moderate average price for the iron industry guarantee for the latter a calm and

[1] Rept. syndicate, in *Ztg. Oberschl. B.-H. V.*, 1897, pp. 201–2.

[2] *Stahl u. Eisen*, 1902, p. 341; *Essen Hk.*, 1899, p. 8.

[3] Bericht d. Cokssyndicat, 1899, p. 4.

[4] Enquete, pp. 646–80.

equable development for the next two years."[1] Unfortunately for the iron industry, the prediction proved utterly untrue, and the bad example of the coke syndicate was followed with even more unfortunate consequences by the iron producers.[2]

From their beginnings and throughout this period also, it was the practice of both the coal and the coke syndicates to conduct their exports at the common expense. That is to say the losses from the sales made by either syndicate below the normal prices did not fall on the individual company whose product was sold, but upon the general account, and this expense was covered by an assessment on all the companies. An indication of how great these amounts were will be considered in detail later. In a similar manner, the syndicates sought to increase the consumption of their products by encouragement to the iron industry for the development of its export business. Thus it appears that in 1897 the coal syndicate, in combination with the iron syndicate and Halbzeugverband (*i. e.*, cartell of half-finished goods such as ingots, etc.) gave to their consumers a bounty of 15 m. per ton exported.[3] The coke syndicate continued to give similar bounties to those already mentioned for 1892, and in 1897 paid out a special bounty of 600,000 marks to the foundry iron syndicate to enable it to meet English competition in Germany.[4]

The coal famine and the crisis—1900. The year

[1] Bericht d. Cokssyndicat, 1899, p. 3.

[2] *Cf.* Calwer, 1901, p. 31.

[3] Oeser, p. 14.

[4] *Cf.* Rept. of syndicate in *Bochum Hk.*, 1895, p. 9; *Ib.* in *Ztg. d. Oberschl. B.-H. V.* 1897, pp. 201–2.

1900 was a very remarkable one in the history of the coal industry. It was characterized by two very incongruous events, namely, an extraordinary demand for coal and an industrial crisis. The first was an almost fortuitous and relatively insignificant event, but perhaps it excited more fear and caused more denunciations of the coal interests, and particularly the syndicates, than the more serious but more doubtful influence of its price policy on industry.

The coal famine began in the autumn of 1899. The winter started in cold, giving a strong demand for house fuel, while industrial consumption had almost reached its zenith. The demand, therefore, was unusually great. On the other hand, the usual sources of supply were not available to their full extent, for though the production of the mines had increased, there was a great scarcity of cars[1], and importations from England were hindered by circumstances arising out of the Transvaal War, and from Bohemia by strikes.[2] There was a strike in Saxony also. The syndicate mines, naturally, were allowed to run to their full capacity.[3] The real shortage of supply from a technical standpoint was overcome by April, 1900, but the rise in retail prices, and the difficulty of getting coal, had created a panic. The situation was made much worse, on the one hand, by extravagant over-bidding on the part of consumers who also demanded more than normal quantities, and on the other hand, by engrossing and running up of prices by the dealers

[1] *Industrie Ztg.*, 1900, pp. 27–8, 41 ; *Stahl u. Eisen*, 1900, pp. 155–8.

[2] The importation of brown coal from Austria fell from 6,166,543 tons in Feb. 1899, to 501,148 tons in Feb. 1900. This compelled many concerns in Saxony to shut down. Calwer, 1900, pp. 83–4.

[3] *Cent. Verb. D. I.*, 1901, p. 230.

and casual speculators. According to the contemporary record of the *Industrie Zeitung*, on the basis of a syndicate price of 112 to 122 m. per 10 ton carload, the price in April had been run up to 220 to 240 m.[1] The rise in price was international in character and was by no means confined to the Ruhr or to Germany.[2]

The blame for these exorbitant prices was generally laid on the dealers, though the syndicates came in for a share of it. The Prussian government gave notice on Sept. 7 that the "raw stuff" railway rate would be allowed to imported coal for at least two years, but it refused to set aside the special export rate for coal.[3] In the autumn, people were still anxious about the coal supply, though those acquainted with the situation, especially in view of the changed *conjunctur*, were looking forward to a decline in consumption. The opportunity was not lost to bring the matter to a parliamentary debate in the Reichstag (Dec. 3, 1900),[4] and resolutions were brought in against cartells in general but aimed at the coal syndicate in particular. When therefore, as though in answer to the criticisms that had been heaped upon it, the Ruhr syndicate announced a contraction of production for the ensuing year, it called forth widespread indignation.[5]

In Jan., 1901, when the trouble was actually over, the Prussian Abgeordnetenhaus appointed a commission to investigate the subject. They reported that there had been a real scarcity (which some had denied), and that great abuses had existed in the retail trade, both as to prices and quality, but that it was a fortui-

[1] *Industrie Ztg.*, 1900, p. 178 (April 5).

[2] *Cf.* Savage, p. 39.

[3] Calwer, 1900, pp. 84–5 ; *Industrie Ztg.*, Sept. 9, 1900, p. 405.

[4] Stenogr. Berichte des Reichstags, 1900–1902, I, pp. 274, *et seq.*

[5] Calwer, 1900, p. 88 ; Sayous, p. 155.

tous event, and its recurrence was not to be anticipated. The principal causes that contributed to the panic, apart from technical difficulties of supply, are said to have been (1) an unsound condition of the market (over-stimulated demand), and, (2) a badly regulated system of selling. So far as the syndicates were concerned, they were neither blamed nor exonerated, but that the attitude of the commission was not hostile to them may be judged from the fact that they proposed fiscal participation in the Silesian Convention.[1]

The syndicate in its annual report for 1900[2] defended itself against the charge of having caused the coal panic. After having described the facts regarding the coal trade during the year, it concludes—"The reasons for this striking phenomenon lay in the over-estimation of consumption." It claimed that the syndicate, as producer of only one-half of the supply of the kingdom, could not be blamed for the coal famine, especially as their proportion of the total production had increased, not only in 1900, but in every year since 1895. Referring to a table showing these facts, the report says:—"These figures disprove anew the assertion which keeps appearing in spite of frequent confutation, and which is advanced with a *tendenziöser* purpose, that the production of the mines combined in the syndicate is artificially held back by the policy of the syndicate." The fact that the output was not equal to the participation figures, the syndicate meets with the assertion that free rein was given to production, and the deficiency simply showed that the technical capacity of

[1] Haus der Abgeordneten 19 Legisl. III, Session 1901. Bericht der X Kommission . . . betreffend die Miss-stände bei dem Verschleiss der Kohlenproduktion, Nr. 12 der Drucksachen.

[2] Bericht d. Rh. W. Kohlen Syndicats, 1900.

the mines was in many cases fixed too high. On the other hand, some mines greatly exceeded their participation.

Of vastly greater importance, though not so quick to excite public apprehension, was the development of a sharp crisis which was followed by a long period of industrial weakness in the succeeding years. The duration of the good times had exceeded all expectations, but whereas at first the continuance of prosperity had been regarded as rather dubious, opinion had gradually come around to the opposite point, so that it was hard to convince many that the era of prosperity was over. Some warning voices had been raised in 1899, but they had not been heeded. The first clear evidence appeared in April, 1900, on the Börse in Berlin; at the end of the month the *hausse* party was decisively beaten, and a decline developed gradually into a general *déroute*.[1] Under these circumstances, a good many weak concerns went under in the mining and smelting industry. Differdingen-Dannenbaum and Aumetz-Friede got into difficulties; one of the big electrical companies failed. Worse still, certain financial institutions as they went down, revealed a situation which tended to shock credit and to discourage investment. This was the case notably in the Pommerschen Hypotheken Bank, and in the following year, in the Leipziger Bank and its *protégée*, the Trebertrocknungs A.G. in Cassel,[2] concerning which criminal processes long occupied the courts. The industrial market was almost as quick to mark the change as the Börse. Prices had been rising rapidly especially in iron goods in the first months of the year, but when the crisis developed in April, orders for iron goods were

[1] Calwer, 1900, p. 18.

[2] *Bochum Hk.*, 1900, p. III.

cut down or cancelled, and in the non-cartelled lines, or those in which the organization was weak, prices fell heavily. The iron and Halbzeug cartells maintained prices for a time but wire, plates, and pipes declined rapidly after the middle of the year.[1]

For the powerful coal syndicate the severe crisis had no peril. The coal famine kept production to the limit of capacity, and from the point of view of the coal market, the crisis year was extraordinarily favorable.[2] The only dangers appeared in the political horizon—in the demands for a prohibition of coal exports, for withdrawing favorable export rates,[3] and in the general attacks on the cartells, as for example, Frhrr. v. Heyls' resolution in the Reichstag which was aimed at the coal syndicate.[4] These perils did not intimidate its leaders, who, continuing their previous policy, determined to contract production to meet the decrease in demand. Some of the staunchest supporters of the cartells (and in particular of the coal syndicate) showed some signs of anxiety and doubt about the price policy at the beginning of the crisis. The Bochum chamber of commerce said: "Prices have reached an elevation which finally must lead to a limitation of consumption. Already a part of the "working-up" industries have not been able to bring selling prices into harmony with the increasing price of materials . . . . . It is best for industry when sharp contrasts in the course of business and earnings are avoided. A small, slowly accomplished price reduction would tend to establish the duration of the present *conjunctur*, which till now has shown itself thoroughly

[1] *Bochum Hk., 1900, passim*; *Essen Hk.*, 1900, pp. 9-10.

[2] *Bochum Hk.*, 1900, p. 67.

[3] *Industrie Ztg.*, Sept. 9, 1900, p. 405; Sept. 27, p. 434.

[4] *Cent. Verb. D. I.*, 1901, pp. 29, 205.

sound ".[1] The coal syndicate, however, which had just gone on to a scale of higher prices held to them. The price norms had been increased generally from 1 to 1.25 marks; Fettförder from 9.10 to 10.10 marks, Gasflammförder from 9.75 to 10.75 marks, Fett-Nuss I from 11.50 to 12.75 marks, Kokskohlen from 8.50 to 10.50 marks.[2] The market prices as shown by the Börse in Essen were,[3]

	Gas	*Gasflamm*	*Fett*	*Mager*
1900	12.75 m.	10.00 m.	10.25 m.	9.50 m.

The attacks on the price policy of the coal syndicate were not left unanswered. The "Dortmunder Verein" published a special *brôchure* reviewing the situation and analyzing the organization and policy of the syndicate.[4] The annual report of the syndicate justified its price policy by a comparison of its prices with those of other districts of Germany and of foreign countries, in which they were able to show that prices in the Ruhr had been generally as low and in most cases much lower than elsewhere. It was admitted that in the wholesale and retail trade prices had been unduly raised, but the report declared—"The syndicate had no share in this over-stimulated price-making."[5]

The crisis year was even more lucrative for the coke syndicate. Its whole output almost had been sold in advance at a high price. Though the manufactures of iron led the way in the general slump of the market, raw iron, on which the coke industry depended, maintained its prices and produced the "record" tonnage to

[1] *Bochum Hk.*, 1899, p. 63 (written in 1900).

[2] Denkschrift, Anlage 2. About 70% of the output was advanced 1.00 m. *Ib.*, p. 13.

[3] *Essen Hk.*, 1902, I, p. 71.

[4] Denkschrift betr. die Verhandlungen des Deutschen Reichtages über die Kohlenfrage. Essen, 1901.

[5] Bericht d. Rh.-W. Kohlen Synd., 1900.

that date, namely, 8,520,540 tons.[1] Under the two year "fusion" contract, coke was sold for nearly the whole supply at 17 m., but for current sales the market of 1900 showed much higher figures, and the average for the year on the Börse in Essen for blast-furnace coke was 21.29 m.[2] Production was pushed to the limit of capacity and reached a total amount of 7,786,347 tons, an increase of 10.5% over 1899.[3] A very significant feature of the situation was the extraordinary increase of coke production of the works owned by the Hüttenzechen from 937,367 tons in 1899, to 1,465,510 tons in 1900, an increase of 56.3%. The report of the coke syndicate claims that the crisis cannot be attributed to the policy of the syndicate in raising prices, and points to the satisfactory profits of their customers, the blast furnaces. It also declares that owing to the strong domestic demand coke exports were limited to pre-existing contracts.[4]

The Coal and Coke Syndicates during the hard times, 1901–1902. The crisis of 1900 continued in the following years producing what are generally called hard times, the burden of which, however, was very unevenly divided among the industries of the country, and can scarcely be said to have fallen at all on the coal and coke syndicates. At the beginning of 1901, some still hoped for and proclaimed a quick recovery,[5] but others were convinced that the market was more permanently shattered and found the cause therefor

[1] *Stahl u. Eisen*, 1902, p. 341.

[2] *Essen Hk.*, 1902, p. 71.

[3] Bericht d. Cokssyndicat, 1900, p. 4.

[4] *Id.*

[5] *Essen Hk.*, 1900, p. 5. "Zu ernsteren Befürchtungen hinsichtlich der weiterentwickelung der Dinge, bietet aber die Situation, nach unsere Ansicht, vorläufig wenigstens keine ausreichende Veranlassung."

not in individual excesses and misdoings, but in a general economic disorder, namely, overproduction.[1] This came to be the generally accepted view of the situation, and the hard times came to be regarded as a necessary process of purification (Reinigungsprozess) following a too rapid growth.[2] Whatever the proper theory of the situation, the facts were plain enough, and in 1901–1902 showed in most lines a discouragingly unreceptive domestic market for all forms of finished products. This was particularly true of the iron trade in rolled products and the finer manufactures and machinery, especially in electrical lines. The most encouraging feature appeared in 1902 in the great demand of the United States which the German producers hastened to take advantage of, though at prices that furnished little or no profit.[3] The domestic prices of rolled products showed very heavy declines as may be seen from the following table:

		Mid year[4]	*July 15*[5]
	1900[4]	1901	1902
Bar Iron	215 m.	120 00 m.	125 m.
Girders	117 m.	110.00 m.	105 m.
Rods	185 m.	130.00 m.	135–140 m.
Boiler Plate	212 m.	180.00 m.	160 m.

The raw iron and Halbzeug cartells, on the other hand, owing to their long contracts and firm organization were much less affected, although they had to re-

[1] The Bochum chamber of commerce wrote in 1901; "das der deutsche Markt der vollständigen inneren Gesundheit entbehrte." *Bochum Hk.*, 1900, p. VII.

[2] "Der Rückschlag kennzeichnet sich vielmehr als ein durchaus nothwendiger und gesunder Reinigungsprozess, der auf jede länger andauernde Aufwärtsbewegung folgen muss." Steinmann-Bucher (?) in *Industrie Zeitung*, Jan. 3, 1902, p. 2.

[3] *Berlin Hk.*, 1902, p. 32.

[4] *Düsseldorf Hk.*, 1901, I, p. 17.

[5] *Glückauf*, Aug. 2, 1902.

duce prices sooner or later also. For the export business, they had to meet the world market price.[1] The average contract prices of the Düsseldorf syndicate showed, in fact, an advance in 1901 for raw iron[2]:

	Puddel	*Thomas*
1900	63.33 m.	65.49 m.
1901	83.14 m.	84.65 m.
1902	58.38 m.	52.62 m.

For Halbzeug the agreed syndicate prices were:[3]

	Feb. 1900	*Mar. 1901*	*Oct. 1902.*
Thomas, Rohblöcke	125 m.	85 m.	77.50 m.
Thomas, Knüppel	135 m.	97 m.	90 m.

Strongest of all was the position of the coal and coke syndicates.

The coal industry was not seriously injured by the crisis, and the dividends in 1901 and 1902 showed only a slight falling off, as compared with 1900, and were higher than in 1899. The chief difficulty with the coal producers was not in prices, over which they had a pretty effective control, but with the disposal of their output under conditions of decreasing demand and rapidly increasing capacity. The weakness of the market in 1901 and 1902 led to a general reduction of output, not only in the Ruhr, but also in Upper Silesia. This was particularly marked for the coal syndicate which produced from 1900 to 1902 as follows[4]:

Year	*Output*	*Per cent. of Prussian Output*
1900	52,080,898 tons	51.08
1901	50,411,926 tons	49 81
1902	48,609,645 tons	48.55

[1] *Cf.* Wieser, pp. 319, 313; *Bochum Hk.*, 1901, p. 107.

[2] Voelcker, Bericht ueber das Kartellwesen in der inländischen Eisenindustrie, p. 128.

[3] Voelcker, Bericht, Eisenindustrie, p. 129.

[4] Bericht d. Kohlen Synd., 1902, p. 8.

As the estimated capacity of the syndicate had greatly increased in 1901 and 1902, the diminution of consumption made it necessary to place heavy limitations on the output of the mines. The contractions projected were, in fact, the highest ever proposed, 13.75% in 1901 and 23.00% in 1902. The actual contraction in each case was somewhat less, being 11.83% and 19.59% respectively.[1] Another means of meeting the difficulty of a decreased domestic consumption was to increase exports. In 1900 they had been 15.5% of the total output, in 1901 they were 16.4% and in 1902 they had increased to 19.0%. Of course, these large exports were disposed of for what they could bring in the foreign markets, and generally below the domestic price.

The coal syndicate maintained its price scale of 1900 throughout 1901 in spite of considerable agitation against it on the part of the consumers.[2] In 1902 the price norms were reduced generally from .50 to 1.50 m. per ton. The market prices on the Börse in Essen were[3]

	Gas	*Gasflamm*	*Fett*	*Mager*
1901	12.75 m	10.00 m	10.25 m	9.50 m
1902	12.00 m	9.72 m	9.60 m	8.75 m

The *déroute* in the iron industry did not affect the coke syndicate very seriously, because it had sold most of its product for two years, and the iron producers who consumed the coke were in practically the same fortunate situation. The production of raw iron showed a decline, however, of 8.6% in 1901, and, though it increased again in 1902, it did not reach the figures

[1] Berichte d. Kohlen Syndicat, 1901, 1902.

[2] They defended the policy by saying they must not injure those customers who had already bought their supply by giving lower prices to their competitors. See Kirdorf, *Cent. Verb. D. I.*, 1901, pp. 238–9. This was perhaps a good defense for 1900, but scarcely holds for 1901 contracts when the situation was plain.

[3] *Essen Hk.*, 1902, I, p. 71.

of 1900.[1] The coke syndicate, therefore, in performing its self-imposed function of accommodating the supply to the demand, was obliged to contract heavily the output of its ovens; viz., in 1901 to 6,833,567 tons, a contraction of 12.25%, and in 1902 to 6,873,162 tons, a contraction of 23.93%.[2] While the production of the coke syndicate had decreased in 1901–1902, as compared with 1900, both positively and relatively, the production of the Hüttenzechen showed a startling increase. In 1902 they produced 19.7% as against 12.2% in 1897.

The coke syndicate, in the matter of prices, was quite as stiff-necked as the coal syndicate. The two-year fusion price at 17.00 m. covered 1901. The current market quotations, as in 1900, rose much above that, and the average of the quotations noted on the Börse was 22.00 m. In 1902, the price norm of blast furnace coke was reduced to 15 m., which was also the price at Essen.[3]

The assistance given to the consumers of coal and coke by the two syndicates, in order to encourage the consumption of those commodities, became of peculiar importance to the iron industry after the crisis of 1900, since the high prices of fuel in the inland market had considerably increased the cost of production, while the opportunity for sale was very limited at home, and the producers of iron goods were forced to sell an unusually large proportion in foreign markets at prices that were usually far from remunerative. In 1901, it appears that the coal syndicate and the Halbzeugverband combined to pay an export bounty of 15 m. per ton to certain consumers, the amount of tonnage to be subventioned

[1] *Stahl u. Eisen*, 1902, p. 341.

[2] Berichte d. Cokssyndicat, 1901, 1902.

[3] *Essen Hk.*, 1902, I, p. 71.

being fixed at a maximum contingent of 33⅓% of the total output of the Halbzeugverband. The coal syndicate was to pay one-third of the bounty.[1]

The system of export bounties was continued in 1902 on a more elaborate plan. The coal and coke interests combined with the raw iron and Halbzeug, girder, wire and plate cartells to pay certain premiums to their consumers, successively, under the condition of exclusive purchase from the allied combinations. A central office was established in Düsseldorf called the "*Abrechnungstelle für die Ausfuhr*" with two executive officers and a council of supervision. For the fourth quarter of 1902 the bounties are reported to have been as follows:[2]

1.50 m. per ton coal.
2.50 " " " raw iron (excl. coal bounty).
10.00 " " " Halbzeug (incl. coal and iron bounty).

The coke syndicate refused to pay these bounties to iron exporters that did not use its coke.[3]

A very significant event occurred in the Ruhr in 1902, at least in its ultimate consequences, namely, the entrance of the fiscus into the district as a mine owner and producer, through the purchase of the mine Gladbeck besides extensive coal lands. For this purpose an appropriation of 58,000,000 marks was made.

We close this brief review of the operations of the syndicates with the year 1902, though at another point we shall have occasion to consider the reorganization of the syndicates which was brought about in the year following.

[1] *Düsseldorf Hk.*, 1901, p. 4.

[2] *Industrie Ztg.*, 14 Mar., 1902, p. 90; *Düsseldorf Hk.*, 1902, p. 34.

[3] *Industrie Ztg.*, 1902, p. 3.

PART III

INTERNAL ORGANIZATION AND POLICY

CHAPTER I

THE RHEINISH WESTPHALIAN COAL AND COKE SYNDICATES[1]

The organization of the coal cartell of the Ruhr for the period 1893-1903 was substantially as follows. The leading idea of this cartell is the abolition of price competition among its members.[2] For this purpose a selling company is established with the exclusive right to the sale of all coal put upon the market by the members of the cartell except in a few cases noted below.[3] This selling company is the syndicate—legally it is an independent society [4]—practically it is an agent of the cartell. Only through such a unitary system of sale is there any guarantee that the same sorts of coal will be sold for the same prices. The second object of the cartell is the regulation of production.[5] The machinery by which these ends are accomplished is briefly as follows:

The syndicate is organized in statutory form as a corporation (Actiengesellschaft) with designation of name, purpose, *i.e.*, purchase and sale of coal, coke and brikets,

[1] A considerable portion of this chapter was published in substantially the same form in *Mines and Minerals* for February and March, 1904, and is reproduced with permission.

[2] *Cent. Verband, D. I.*, 1901, p. 228, Kirdorf.

[3] Vertrag, § 1, ¶ 1-3. A mine cannot sell coal in the ground to third parties. Enquete, p. 36.

[4] Enquete, p. 34.

[5] *Cent. Verband, D. I.*, 1901, p. 228.

and domicile (Essen), (Statut, §§ 1, 2). It has the usual organs of an Actiengesellschaft, namely, executive committee (Vorstand), supervisory council (Aufsichtsrat), and general assembly (General-Versammlung) possessing the usual statutory powers (Statut, § 5). The capital is fixed at 900,000 marks and is divided in registered shares of three hundred marks each, transferable only with the consent of the Aufsichtsrat and the general assembly (Statut, § 3). These shares, as a matter of fact, are held by the mine owners exclusively.[1] The capital is purely nominal in amount and has no practical significance. The Vorstand consisting of two or more persons[2] is appointed by the Aufsichtsrat, and is therefore dependent on it (Statut, § 6). The functions of the Vorstand are extensive and include, (a) the purchase and sale of coal, coke and brikets produced by the syndicate mines or others (Statut, § 2, 5, Vertrag, § 1, ¶ 1, 4, 5, 6 and 7), (b) the determination of the actual selling price and the so-called accounting price (Vertrag, § § 4, 5), (c) the proposal of the amount to be assessed on the mine owners to cover the costs and losses of the syndicate— "Umlage" (Vertrag, § 6), (d) the power to examine the books of the individual mines (Vertrag, § 7), (e) the calling of meetings of the mine owners (Vertrag, A. ¶ 6), and (f) the proposal of fines in case of breach of the agreement (Vertrag, § 8, ¶ 4). The Aufsichtsrat is composed of nine members, one third being elected each year by the general assembly (Statut, § 7), its functions are mainly supervisory; it appoints the Vorstand. The general assembly elects the Aufsichtsrat. Each share gives a right to one vote (Statut, § 10).

[1] No foreign capital is employed by the syndicate. *Cent. Verb., D. I.*, 1901, p. 227.

[2] At present four. Steinkohlenzechen, p. 86.

This syndicate (which as we have said is really composed of the mine owners), has a contract with the mine owners severally[1] by which it obligates itself to sell the whole output of the mines, (with some minor exceptions) under certain arrangements as to price and payment; the mine owners on the other hand obligate themselves to sell all their coal, coke, etc. to the syndicate, (Vertrag, § 1). Further, they agree with the syndicate and with each other to join together to form an organization of mine owners which shall make certain rules and confer authority on certain representatives, which rules and authorities the aforesaid mine owners obligate themselves to obey (Vertrag, intro.). This is the most vital part of the cartell. The principal features are as follows: all mine owners associate themselves into a loose body known as the assembly of mine-owners (Versammlung der Zechenbesitzer[2]) and establish two other organs of government known as the advisory council (Beirat) and the commission for fixing the participation figures (Kommission zur Feststellung der Beteiligungsziffern). The assembly of mine-owners meets as often as necessary, which is determined by the Beirat (generally monthly), or on demand of one-fifth of the votes. The summons come from the Vorstand of the syndicate. The votes are allotted on the scale of one vote to every 10,000 tons production. The chairman of the Beirat presides (Vertrag A.). The chief functions of the assembly of mine-owners are as follows: (a) election of Beirat, (b) election of commission on participation figures, (c) determination of amount of contraction of production, (d) determination of contribution and compensation (for

[1] In 1893 the number was ninety-nine, in 1901 it was eighty-five. *Cent. Verb., D. I.*, 1901, p. 227.

[2] This is a "Gesellschaft des bürgerlichen Rechts." Enquete, p. 34.

production above or below the allotted quantity), (e), admission of new members and (f) determination of share holding in the syndicate (Vertrag A.). The Beirat is constituted on the basis of one member for every million tons of production; groups of mine-owners may join to elect a member. It is chosen annually (Vertrag B.). The powers and functions of the Beirat are as follows: (a) it chooses its presiding officers (Vertrag B.), (b) it fixes the general price norms (Richtpreise) (Vertrag, § 5), (c) it decides how high the assessment (Umlage) shall be (Vertrag, § 6), (d) it adjudges penalties on demand of the Vorstand (Vertrag, § 8, ¶ 4), (e) it determines to a certain extent what persons shall serve on the commission for fixing the participation figures, (Vertrag C., ¶ 4), and, (f) it is a court of appeal on the determination of the participation figures (Vertrag, § 2, ¶ 5), prices paid to the mines (Vertrag, § 5, ¶ 3), and of quality of coal furnished by the mines (Vertrag, § 5, ¶ 5). The commission for fixing the participation figures is composed of four members, including two technical experts, a merchant and a member of the Vorstand. Twice the required number in each case are named by the assembly of mine-owners. The Beirat decides which shall act in each particular case with reference to procuring the most impartial settlement of the business, and may under certain conditions summon other persons to act. In case of a tie vote, the chairman of the Beirat decides (Vertrag C.). We come now to certain important specific rules in the agreement which guide the organs of the association in their actions.

Participation in Production. If a mine desires an increase in the allotment for production, a notice of six months must be given. An increase of production

should be granted according to the following provisions; (1) if, in the view of the Vorstand, it involves no general reduction for the rest of the mines it may be allowed; but, (2) if it does involve such a reduction, the commission for fixing the participation figures considers the proposed increase and acts according to the following rules, (a) in the case of a new shaft there must be proof of the technical capacity of production; (b) in other cases not only technical capacity but also the situation of the coal market may be taken into account in judging whether the claim ought to be allowed (Vertrag, § 2, ¶ 2, 3, 4). Every mine owner has the right and duty to participate in production according to the amount of his participation figure. If a contraction in the total output is made, it must be by a proportional reduction for all mines. In reckoning participation and contraction, all shafts belonging to a single company are taken together as a unit. Selling combinations (Verkaufsvereine) of several mines are allowed the same privilege (Vertrag, § 2, ¶ 7–10). In case the occupation of the mines is not in due proportion, those that exceed their allowed quantum must pay a contribution, and those that fall short of the same are entitled to a compensation. The contribution and compensation are fixed per ton and must equal each other, (Vertrag, § 2, 11, 13). Reductions of participation may be obtained by claiming them with four weeks notice. The Vorstand may be empowered by the assembly of mine-owners to permit a mine to reduce its participation outside of the regular order (Vertrag, § 2, ¶ 7, 14).

The obligation of the mine-owners to sell all their coal, coke, etc. to the syndicate is subject to certain exceptions, as follows: (a) use in the mining works

themselves (Selbstverbrauch), (b) local supply, excluding the regular supply of works (Landdebit), (c)the supply of mine officials and mine laborers and charitable dispositions (Deputatkohlen, etc.,). These dispositions come however under the control and oversight of the syndicate; where the coal is sold to the neighborhood and to mine employees (Landdebit and Deputatkohlen). it comes also under its price control; they are all included in the calculation of the participation figures [1] (Vertrag, § 1, ¶ 2, 3).

Determination of Prices. The Beirat fixes the normal prices of coal of average quality[2] (Richtpreise), which are used as a guide by the Vorstand in fixing the so-called accounting-prices (Verrechnungspreise), the latter being the prices at which the syndicate takes the coal from the mine-owners (Vertrag, § 4, § 5, ¶ 1, 2). They vary somewhat according to quality, some being over and some below the normal prices.[3] The Verrechnungspreise are also substantially those at which the syndicate sells the coal in general, that is, in the non-competitive regions. In the competitive regions, the syndicate takes what it can get, it may ask more, but it is generally compelled to take less. But in all cases, the mine-owners get at least the Verrechnungspreise (Vertrag, § 5). Any excess of the actual selling price over the Verrechnungspreis, if obtained in the non-competitive regions, goes to the mine supplying

[1] The syndicate coal mines owned by blast furnaces give notice each year how much they will retain for their own use, and the price for the same is arranged with the syndicate. *Stahl u. Eisen*, 1900, p. 671.

[2] Enquete, p. 60.

[3] Id., p. 69. Essential variations of the selling price from the normal price, are to be explained, apart from error, by the necessity of reducing the prices in order to make a sale—a fundamental obligation of the syndicate. *Cf. Cent. Verb. D. I.*, 1901, p. 233.

the coal, in other cases it belongs to the syndicate (Vertrag, § 5, ¶ 4.)

Since the total sales of the syndicate do not normally equal the total which it has to pay to the mine-owners together with other expenses, a general monthly assessment (Umlage) is made on all the mines to cover the deficit (Vertrag, § 6). The terms of the contracts of sale to the consumers are made by the Vorstand (Vertrag, § 4); the mines are responsible for the supply of the coal, *i. e.* of the proper weight, quality, etc. (Vertrag, § 5, ¶ 5); the syndicate has the financial responsibility of the sale (Vertrag, § 1, ¶ 1). The accounts between the syndicate and the mine-owners (including the Umlage) are settled monthly (Vertrag, § 5, ¶ 4, § 6).

Penalties. For every evasion of the selling agreement by a mine-owner, a fine of fifty marks per ton is established (Vertrag, § 8, ¶ 1); for failure to furnish the supply due, penalties are to be fixed by the assembly of mine-owners (Vertrag, § 8, ¶ 2); for all other breaches of the contract; the fine is one thousand marks but this may be reduced by the assembly of mine owners to one hundred marks (Vertrag, § 8, ¶ 3, 5). The levy of fines does not prejudice any claim for damages the syndicate may have (Vertrag, § 8, ¶ 9).

A peculiarity of the syndicate is that it has not generally speaking profits or losses; all its expenses are covered by assessments on the mine-owners.[1] Its capital is a merely nominal sum—900,000 marks. The syndicate has apparently invested a part of it in the "Westfälische Transport A. G.[2] The report of the syndicate for 1902 expresses the hope for a moderate profit from this company for the ensuing year.[3]

[1] *Cent. Verb. D. I.*, 1901 p. 227, Kirdorf.

[2] Enquete, p. 29.

[3] Ber. d. Rh. Westf. Kohl. Synd., 1902, p. 10.

The Westphalian Coke Syndicate. The organization of the coke syndicate is very similar to the coal syndicate and, indeed, was indirectly the model on which the latter was formed. The "Statut" of the coke syndicate specifies the name (Actien-gesellschaft Westfälisches Cokssyndicat), site (Bochum) and business ("purchase and sale of coke and coal"[1]) of the undertaking (§§ 1, 2). The capital is fixed at 400,000 marks, divided into two thousand registered shares (§ 3). The organs are: (a) Vorstand, (b) Aufsichtsrat and (c) general assembly (§ 4). The Vorstand is composed of two members who are elected by the general assembly on nomination by the Aufsichtsrat (§ 5). The Aufsichtsrat is composed of fifteen members elected by the general assembly (§ 8). The general assembly requires a majority vote for its determinations in general, but in certain cases (*e. g.*, merger or dissolution) a three-fourths vote is necessary (§ 14).

The treaty of the cokeworks-owners with the syndicate and each other is entitled "the regulation for business and purveyance" (Geschäfts- und Lieferungs-Ordnung). The general organization and the terms of the contract are similar to those of the coal syndicate, except there is no Beirat. The Aufsichtsrat of the coke syndicate performs in general the functions of the Beirat of the coal syndicate. The reason for this probably is purely practical, *i. e.*; the small number of members (44)[2] make any such intermediate organization between the general assembly and the Aufsichtsrat unnecessary. The chief powers of the Aufsichtsrat are: (a de termination of the accounting price (Vertrag, § 4), (b) assessment of fines (Ordnung, § 2, 9), (c) proposal of

[1] Not Kokskohle as stated by the Referent in the Enquete, p. 614.

[2] Enquete, p. 791.

Umlage (Ordnung, § 6), (d) selection of commission on participation (Ordnung B), (e) final determination of proper fulfillment of contracts, (Ordnung, § 5), (f) nomination of Vorstand (Statut, § 5) The general assembly of cokeworks-owners is composed of official representatives of each concern who have one vote for each 1,000 tons of participation (Ordnung, A). The most important powers are: (a) determining the contraction (Ordnung, § 2), (b) determining the Umlage (Ordnung, § 6), (c), appeal on questions of participation and fines (Ordnung, § § 2, 9), (d) election of commission on participation (Ordnung, A).

The commission for fixing the participation figures is composed of four members, including two technical experts, a merchant and a member of the Vorstand. Double the number are chosen in each case, and the members are selected by the Aufsichtsrat with regard to procuring the most impartial judgment in each instance, and, if necessary, other persons may be substituted (Ordnung, B).

The cokeworks-owners agree to sell through the syndicate all their coke which is put up for sale, except Landdebit, in so far as neighboring works are not regularly supplied. The consumption of coke in the coke works is not included in the participation figure (Ordnung, § 1).

The regulations for the participation figures are established as follows. In the case of a new member, the commission for fixing the participation figure determines the technical capacity simply, which gives the participation to be allowed. In the case of a demand for an increase of participation by a member, the commission must consider not only the technical possibility but also the situation of the market. Appeal from the

decisions of the commission may be taken by the Vorstand or the party claiming the grant of participation to the general assembly of cokeworks-owners (Ordnung, § 2). In case the situation of the market makes a contraction of production necessary, the same must be made proportionally to the participation (Ordnung, § 2). Cokeworks united under the control of a single concern or a "selling union" are regarded for this purpose as a unit (Ordnung, § 2).

The coke syndicate purchases the coke from the cokeworks-owners according to the terms of § 4 of the treaty with the coal syndicate (see below). The prices at which the coke shall be sold are also regulated by § 4 of that treaty (Ordnung, § 3). The cokeworks-owners are responsible for the fulfilment of the orders given to them, in respect to quantity[1] and quality, and must pay any costs arising from any deficiency therein. The Vorstand decides in the first instance if such an obligation has been incurred; appeal may be made to the Aufsichtsrat (Ordnung, § 5).

Penalties are provided as follows: For failure to furnish the quantities assigned, a fine is imposed of two marks per ton short (Ordnung, § 2). For direct sale contrary to the provisions of the agreement, a fine of fifty marks per ton is imposed (Ordnung, § 7). For other violations of the agreement, a fine of one thousand marks is imposed (Ordnung, § 8). The Aufsichtsrat adjudges the fines, but appeal lies to the assembly of cokeworks-owners (Ordnung, § 2, 9). Further the assembly of cokeworks-owners under unusual conditions may reduce a fine from one thousand to one hundred marks (Ordnung, § 9).

[1] In 1899 the syndicate threatened to reduce the participation of members if they did not fulfill the orders given them. *Indust. Ztg.*, 1899, p. 409.

In order to defray the expenses of the coke syndicate a proportional assessment (*Umlage*) is to be levied monthly at an amount to be fixed by the assembly of cokeworks-owners (Ordnung, § 6). The Vorstand of the coke syndicate has the right to examine all books and papers of the syndicate members (Ordnung, § 10).

The treaty between the coal syndicate and the coke syndicate was established March 11, 1895, by which the sale of the coke was transferred to the coal syndicate for the benefit of the coke syndicate for three years. This was afterwards (Dec. 11, 1897) extended for five years to Dec. 31, 1902, and later for another year.[1] The principal provisions of the treaty are as follows. The relations of the coke syndicate to the cokeworks-owners are left undisturbed (Vertrag, § 1, 6). The participation figures of the cokeworks are to be determined anew on the basis of their actual capacity (Vertrag, § 2). A contraction of coke production shall be determined by the coke producers, but it must have also the assent of the Vorstand of the coal syndicate, or failing that, the assent of the Beirat of the coal syndicate (Vertrag, § 3).

The normal prices (Verrechnungspreise) of coke are to be fixed by the Aufsichtsrat of the coke syndicate on the proposition of the Vorstand of the same.[2] These are the prices to be credited to the coke works. The Vorstand may not sell below these prices, except, abroad in cases of pressing necessity, and, in the domestic market only with the consent of the Aufsichtsrat; such loss as is thereby incurred must be borne by the coke syndicate, but any gain obtained by higher prices is to be credited to the coke works supplying the coke (Vertrag, § 4).

[1] *Industrie Ztg.*, 1902, p. 482.

[2] There are no "Richtspreise" in the coke syndicate, or rather the Verrechnungspreise stand in place of them.

The expenses and losses of the coke syndicate are to be covered by an assessment (Umlage) levied on the coke-works-owners : (Vertrag, § 5).

The coal syndicate agrees not to supply coking-coal to private coke works but to transfer all dealings with the private coke works to the coke syndicate (Vertrag, § 7). According to a subsequent agreement, (Jan. 18, 1897), the coke syndicate agreed to elect two members of the Vorstand of the coal syndicate to the Aufsichtsrat of the coke syndicate, and agreed further not to purchase any coal from non-syndicate mines. The Vorstand of the coal syndicate acts as an agent in the sale of coke or as an organ of the coke syndicate ; it has also the right to check all its shipments.[1]

We should notice here the treaty between the Ruhr coke syndicate and the Belgian coke syndicate. This was made in 1894 and provided for a division of the field. The terms are given by de Leener as follows. There are two *rayons*. *Rayon* A comprises the Longwy district, the region about Nancy, Alsace-Lorraine, Luxemburg and Germany ; in these regions the share of the Belgian syndicate is 19.18% and the share of the Ruhr syndicate 80.82%. *Rayon* B comprises Belgium, Haute Marne and northern France ; the share of the Belgian syndicate is 63.5%, the share of the Ruhr syndicate 36.5%. Provision was made for certain payments in case one party or the other exceeded the agreed quota, but practically they have succeeded in regulating the sale conformably to the provision of the *rayons*.[2]

The coal syndicate is united with the Briketverkaufsverein under a treaty similar to that which it has made with the coke syndicate.[3] There is no cartell agreement,

[1] Enquete, p. 616.

[2] de Leener, pp. 230-1.

[3] Denkschrift, p. 5.

however, between the coal or coke syndicates and the "Teer" and "Ammoniak" and "Benzol" cartells,[1] though they are nearly identical with the coke syndicate. The relations with the iron cartells seem to be limited to numerous close personal interests,[2] on the one hand, and to the export bounty associations on the other.

The cartell agreement, under which the coal activity of the coal syndicate has developed so far, was to terminate at the end of December, 1905; provided, that, if no member made a written objection one year before its expiry, it should be continued for ten years. That it will be continued according to that provision seems more than doubtful, when the sharp differences and conflicts of interest between the mines are taken into consideration. The original treaty was a work of compromises, and as the chairman Herr Kirdorf says[3] was not regarded by the parties themselves as a perfect instrument. Some of the defects arose from the unavoidable conditions of the situation, some lay in the plan of organization. The two chief defects of the former kind were the lack of identity of interests of different groups of mines, owing to different conditions of production, and the lack of identity of interests between the companies solely engaged in the production of coal and coke, and those also engaged in the manufacture of iron, in transportation, etc.

The parties among the coal mining concerns may be grouped, first, according to the kind of coal mined, and second, according to the size of the mines. In the first group there were two parties and three sorts of coal, namely, the producers of Fett and Gas coal on the one

[1] Enquete, p. 625.

[2] *Id.* p. 68.

[3] *Cent. Verb. D. I.*, 1901, p. 226.

side and Mager coal on the other side; that is, the bituminious against the hard coal. The former party produces the chief sorts of industrial coal, including coking coal, gas coal, steam coal, etc. The latter produces chiefly a house fuel (especially for winter consumption), though its product is also largely used for lime and and brick burning and briket manufacture. The quantitative importance in 1902 was as follows:[1]

	Output	*Per cent of total*
Fett	28,859,000 tons	59.37
Gas and Gas flame	13,912,000 tons	28.62
Mager and Ess	5,837,000 tons	12.01

The trouble lay with the minority producers of Mager and Ess coal.[2] They have a high cost of production, and, unless prices are made pretty high for other sorts of coal, they are not able to obtain a price for their less favored product which will give them adequate profits.[3] If the prices of Mager coal were advanced without raising the prices of the other sorts, they simply would not find any sale. Hence they belong to the radical wing of the high price party in the councils of the syndicate. There are other difficulties with the Mager coal group, but they belong rather to the avoidable kind and will be considered below. As the Mager coal producers are in a small minority, they would not have much influence on prices if it were not for the fact that there is another group that has a similar interest; this is the group of small mines.[4] According to the participation figures for the first of January, 1903, there were twenty concerns with between 100,000 and 200,000 tons, twenty-six concerns between 200,000 and 500,000 tons, twenty-two concerns

[1] Ber. d. Rh. Westf. Kohlensyndicat, 1902, p. 7.

[2] *Cf.* Enquete, p. 45.

[3] Enquete, p. 58.

[4] *Cf.* Enquete, pp. 46, 58.

between 500,000 and 1,000,000 tons, twelve concerns between 1 million and 2 million tons, two concerns between 2 million and 5 million tons and two concerns over 6 million tons.[1] The voting, as we have seen, was in proportion to tonnage, and for the Beirat, a member was eligible for every million tons owned by a mine or group of mines. Just how the votes were combined is a matter not made public, but the small mines had at least a considerable influence. The small mines represent on the whole a lower grade of productivity than the large ones. Other differences existed between them which we may consider at another point.

The advantages of the syndicate to the different mines is difficult to determine. The following from the *Frankfurter Zeitung* throws some light on the problem. "Whether the coal syndicate is more advantageous to the large or to the weaker mines has been a subject of differences of opinion from the beginning and is so still. The relations naturally are not everywhere the same, so that in individual cases the combination can give very different results. In general, it is well established that the organization of the syndicate has been of great value for the less capable mines, inasmuch as these by means of the combination are dragged along by the productive mines in good and bad times. On the other hand, the small mines complain that the existence of the syndicate is used by the large concerns to their disadvantage, because these with their preponderance in coal fields, in capital and in credit, can proceed much easier in the laying out of new shafts and thereby increase their participation correspondingly. But under the present (1903) relations, the large concerns with several shafts

[1] Enquete, p. 281. The average is about 740,000 tons.

are compelled to contract their output to the advantage of the weaker mines, since under free competition, they would be able to use their productive power considerably more, just as the outsiders are able to do. This view is often openly expressed in the circles of the leaders of the large mines, and it is thereby emphasized that they really set little store on the prolongation of the syndicate, because they are not only equal to the situation without its continuance, but also would obtain a greater profit without it. Further, the continued refusal of the large non-syndicate mines to enter the syndicate appears to support the assertion that it is just with the large undertakings, that the syndicate is not able to make good in the manner that they desire."[1]

The smelter mines (*Hüttenzechen*) form another group whose interests are not, from the nature of the case, entirely the same as the other mines; but the principal difficulties are avoidable by special provisions in the agreement. It seems to have been to their advantage to support the coke interests in keeping up high prices for coking-coal and coke. A rather peculiar element of the situation was that there were certain coal mines owned by Rhine transportation companies whose predominant interest was to have low coal prices in order that coal shipments might be as extensive as possible.[2]

The chief difficulties that arose in the operation of the cartell, owing to the form of the treaty, were concerning the participation figures, the Umlage, bounties, the smelter consumption, the too loose relations of the coal and coke cartells and the lack of general powers of the

[1] *Frankfurter Ztg.*, 5 Jan., 1903; quoted in *Kartell Rundschau*, II, p. 102.

[2] Sarter, pp. 30–1.

coal syndicate. The really fatal weakness was the method of granting increases in the participation figures. The treaty provided that the increase of participation could be demanded as of right in the case of new shafts when they proved a technical capacity of production; for the existing mines, no increase of participation could be obtained, practically, unless the situation of the market made it possible to sell the already existing allotments.[1] This provision worked badly for the whole syndicate and with especial injury to the smaller companies.[2] For the syndicate in general, it was a great disadvantage, because it provoked a race among the companies to increase their participation figures. The increase in participation figures grew more rapidly than the possibilities of sale, except for one or two years of the boom, and when the crisis came an enormous contraction of production was required. The advantage to the individual mine obtaining an increase lay in the fact that the increase in participation was greater than the subsequent contraction. To get this the mine had to undertake the very expensive development of new shafts, which meant a relative increase of capital per ton output. This was a paying policy as long as the price of coal was high. The advantage of the policy would be very great, however, only as long as the number of mines which pursued it was relatively small. If it became general, it would result in a loss. As a matter of fact, the practice was carried so far in recent years that it threatened to become a losing game, but nevertheless, a game which no mine would give up unless the

[1] On the other hand there are mines with a participation in excess of their capacity. When a contraction is made, they are given an undue advantage, *Cent. Verb., D. I.*, 1901, p. 231.

[2] *Kölnische Ztg.*, May 15, 1903.

others did. This evidently required a better governing power in the syndicate. For the small mines which did not have the coal fields and capital required for the operation the practice was wholly injurious. For the consumer, too, it was injurious, because the increase of capacity did not mean any increase in production or reduction in prices; on the contrary, it furnished another motive for keeping prices high. In the coke syndicate, this difficulty was avoided simply by providing that there should be no increase in participation unless the situation of the market made it practicable.

Another very important difficulty was concerning the Umlage. The Umlage is assessed partly for the payment of the general administrative expenses of the syndicate, but mostly for the promotion of the export trade and the sale of coal in other competitive regions where the price paid to the syndicate is less than the price the syndicate has to pay to the mine supplying the coal. The coal so shipped is for the most part of the finer qualities, since it must be able to bear the cost of transportation. These kinds of coal are not produced much by the Mager coal mines nor by the small mines either to any great extent, because it requires a good deal of capital to erect the plant for refining the coal. Hence these mines have little or no benefit therefrom and, nevertheless, have to pay the tax. The same is true to a considerable extent of the Hüttenzechen, which use most of their own production. The Mager coal mines require a greater percentage of their coal to operate their works and so find the tax disproportionately heavy. The Umlage works unequally in other ways. In some years, a considerable portion of it has been levied for the purpose of paying export bounties to the iron manufacturers, on the ground that the

consumption of coal was maintained thereby. But not all the mines produce a fuel adapted to use in the manufacture of iron. Here again, the Mager coal interests were at a disadvantage. The smelters, etc., which owned coal mines at the time of the formation of the syndicate did not come in naturally, because they had very little coal to sell.

The advantages of owning an independent supply of raw material became more and more apparent to the iron producers, especially as the prices of coal steadily advanced. Some of the syndicate mines were bought up by iron concerns with the object of acquiring control over supply. Such transfers did not free them, practically from the control of the syndicate. At least the vendors would remain liable, so that if the purchasers did not conform to the obligations of their predecessors, the syndicate could bring an action for damages against the vendors.[1] Iron works owning such mines had to buy their coal, therefore, at syndicate prices. They claimed, indeed, that they were exempt on that coal produced which they used in their own iron works, according to the provision of the treaty which excludes "Selbstverbrauch" (*i. e.*, coal used in operating the works) from the price control of the syndicate. This claim, however, was not allowed by the courts.[2] Such mine-owners would, obviously, never consent to the continuation of the treaty with such a provision beyond the period of legal obligation. They also found it unfair that they should pay the Umlage on the same basis as the other mines, because they had little interest in export (especially at prices that would aid their rivals), and in so far as the

[1] Enquete, pp. 35–6.

[2] *Industrie Ztg.*, 1899, p. 557.

Umlage was expended for bounties, the advantage they obtained from such payments were perhaps more than offset by the encouragement it gave their competitors.

Finally we may notice that the cartell had certain general defects which prevented a harmonious or efficient operation. One, undoubtedly, was the loose relation existing between the coal and coke syndicates. The two commodities were produced by the same interests to a large extent, the coke being a product of the Fett coal group. The producers of coking-coal tended to get a still greater influence in the price policy of the syndicate through their influence on the price of coking-coal.

Another defect of the syndicate may be said to be rather a defect of the cartell system, namely, a lack of general powers. Cartell government, even in its more elaborate forms, is like that of a political confederacy. The central power is too feeble; the stipulations introduced for the protection of the members tend to make the cartell weak in its relations with outsiders. It limits the competitive power of the combination. This seems to be true, for example, in the relations of the syndicates to the local outsiders. They have grown faster than the syndicates (especially the coke producers), expanding their production, taking lower prices than the syndicate when the market is weak, and exacting higher prices than the syndicate when the market is strong. As the syndicate leaders confess they "got their fill" first,[1] and they have the best of it in prices. But without the syndicate, they would be no better off than other producers. They stay out for their own advantage as

[1] Enquete, p. 78.

against the advantage of their industry. With greater war powers, the syndicate might perhaps bring them to terms, though it would be very difficult. In some ways, the syndicate would be stronger, if it could expel some of its members, *i. e.* the poor mines, especially the Mager coal producers. If they were outside, they might be driven out of the business entirely by a price war, and the richer mines could monopolize the field afterwards. Herr Kirdorf, the head of the coal syndicate, said in the recent government investigation that he would have preferred to have had them stay outside.[1] He frankly acknowledged that he thought the cartell would be more effective if it had an autocratic instead of a parliamentary system, *i. e.* if the Vorstand controlled the whole business; at the same time, however, he declared that it was impossible to make any extensive changes in the organization as things stood.[2]

Such, in general, were the weaknesses of the syndicate. Its control of the situation was rendered more precarious in recent years through three circumstances, (1) the enormous increase of the claims for participation, (2) the danger of losing more mines through purchase by the blast-furnaces and other consumers, and (3) the development of new coal fields in the north. The amount of participation on Jan. 1, 1902 was 58, 973,003 tons[3]; it had increased by Jan. 1, 1903 to 62,199,437 tons.[4] It was reported to have advanced on July 1, 1903, to 64,090,000 tons, with 1,533,000 tons in claims awaiting adjustment on October 1, 1903.[5] Besides

[1] Enquete, p. 58.

[2] Id, p. 57.

[3] Bericht d. Kohlen Syndicat, 1902, p. 6.

[4] Enquete, p. 281.

[5] *Kölnische Ztg.*, July 24, 1903.

this, there were claims pending on account of old shafts of 6,800,000 tons[1] which could not be allowed until the market situation made it possible to remove limitations on production. The actual output in 1902, however, had been restricted to 48,609,645 tons.[2] As the *Kölnische Zeitung* declared, "Particularly must the nonsensical chase of the individual mines after higher participation figures be put a stop to once for all."[3] Between March, 1899, and May, 1900, eight syndicate mines passed into the hands of blast-furnaces.[4] The crisis brought a stop to this movement temporarily, but it was beyond question that after the termination of the existing obligations of the compact, which expired at the end of 1905, others would be absorbed, unless measures were taken to prevent it. Of greater importance even than this was the development and purchase of new mines in the north, especially, by iron producers.[5] Deep shafts are required here and are made possible by the modern improvements in technique. These northern coal fields have been developed largely through the enterprise of boring companies.[6] In order to protect itself against future competition, it was evidently necessary for the syndicate (1) to make the conditions sufficiently favorable to the "Hüttenzechen" to induce them to stay in the cartell, (2) to bring in the principal outside

[1] *Kölnische Ztg.*, May 15, 1903.

[2] Bericht d. Kohlen Syndicat, 1902, p. 8.

[3] *Kölnische Ztg.*, June 26, 1903.

[4] Enquete, pp. 275–8.

[5] *E. g.* Minister Achenbach by Gebr. Stumm, de Wendel by de Wendel, Maximilian by Maximilianhütte, Emscher-Lippe by Krupp and the Norddeutscher Lloyd. *Cf. Berliner Tageblatt*, July 27, 1903, Liefmann, Schutzzoll, p. 70.

[6] Especially the International Bohrgesellschaft, Norddeutscher Tiefbohr A. G., the Westfalen and the Anna Liese. *Tageblatt*, July 27, 1903; *Dortmunder Ztg.*, July 9, 1903, etc.

competitors and (3) to get a dominant influence in the new territory in the north.[1]

The plans for a new cartell compact were under way in 1902, but their contents were not generally known until May, 1903. From that time until the end of the year, a very lively propaganda was carried on in the circle of coal interests to bring about its acceptance, and the disastrous effects on the mining industry and on German industry in general, if it failed of acceptance, were painted in the darkest colors. There was a very powerful opposition from certain large mines within the syndicate itself on account of the clause which provided that no claims for participation, not allowed by September 30, 1903, should be granted, except under the terms of the new compact, (which was to go into effect the following day, if accepted) which practically meant a long postponement.[2] Even more serious difficulty existed in inducing the entry of outsiders. There were about thirty-seven outsiders in the district in 1902 which produced coal. Of these thirteen were owned by blast-furnaces, etc. and produced about 6,679,000 tons; the remaining twenty-four produced about 3,225,000 tons.[3] Five of the outside mines with a production of 2,055,499 tons belonged to two companies (Krupp and Bochumer Verein) which had mines in the syndicate and sold their extra production through the syndicate. The chief problem, therefore, was to persuade those to join who had no connection with the syndicate. The most important Hüttenzechen were Deutscher Kaiser (1,576,-593 tons), owned by the Thyssens, great iron manufact-

[1] *Industrie Ztg.*, 1902, p. 182.

[2] *Frankfurter Ztg.*, Sept. 13, 1903; *Kartell Rundschau*, 1903, pp. 858-9.

[3] Steinkohlenzechen.

urers; next the mines of the Gutehoffnungshütte (1,389,953 tons), Dortmunder Union (570,353 tons), Phönix (459,468 tons), Hörder (427,391 tons), which together with the others had a total output in 1902 of 4,623,973 tons. The remaining twenty-four outsiders produced 3,224,646 tons and of these only seven over 100,000 tons apiece. By far the most important were the two mines of the shipping firm of Haniel, Neumühl and Rheinpreussen, which produced 1,070,792 tons and 800,000 tons (approx.) respectively. The chief problem evidently was to secure the adhesion of Haniel and Thyssen and they made various difficulties with the apparent aim of exacting the largest possible participation.[1] A meeting on September 15, having failed to obtain a unanimous consent to the new compact, another meeting was called for September 30, at which it was accepted in spite of the refusal of one small mine (Freie Vogel u. Unverhofft) to sign. According to the terms of the old compact, it could not be terminated before the end of 1905, except by unanimous consent or notice of one year by four-fifths of the votes. The old compact was not legally terminated, therefore, with the beginning of the new one, as notice was not given by the required number of votes before September 30, 1903, and it is said that the syndicate will observe all its obligations to this one mine according to the terms of the old compact.[2] For the rest of the syndicate, the new compact took effect on October 1, 1903, and it was agreed that it should last in any case until the end of 1905, and, if accepted by all the outside mines with an output of more than 120,000 tons per annum (including Hüttenzechen), then it should stand until the end of 1915.[3] The task of

[1] *Kartell-Rundschau*, Aug. 28, 1903, p. 859.

[2] *Tageblatt*, Oct. 2, 1903.

[3] *Ib.*

bringing in all the outsiders was not an easy one. The difficulty was not so much any inveterate hostility to the syndicate idea or system, as the hope to make a good thing out of the situation, either (1) by obtaining exorbitant concessions in regard to rights of participation, or (2) by remaining outside and getting all the advantages accruing to the coal industry through the existence of combination without paying any of the costs. They all came in finally. Haniel received the enormous participation of 6,500,000 tons.[1] At a meeting held on December 29, 1903, the new compact was established to last until December 31, 1915.[2] All mines having a production of 120,000 tons or more, except Freie Vogel u. Unverhofft and the fiscal mine Gladbeck, are parties to the agreement. The effort to bring in the mines of the Aachen district failed. The participation, which on Oct. 1, 1903 amounted to 64,496,640 tons, was increased by the new accessions to 77,840,000 tons on Dec. 30, 1903, although by the terms of the new compact, a part of the production, namely, that used in supply of the mines, blast-furnaces, etc. connected therewith, is not included.[3]

Even before the new compact was ratified, the syndicate, according to report, had begun to negotiate for the acquisition of coal fields, while individual mines or groups of mines had also been active in the purchase of coal fields or of shares in the boring companies.[4] According to some views, these boring enterprises partake considerably of the nature of a "hold-up," but it is

[1] *Frankfurter Ztg.*, Dec., 17, 1903.

[2] *Tageblatt*, Dec. 30, 1903.

[3] *Frankfurter Ztg.*, Dec. 30, 1903.

[4] *Tageblatt*, July 17, 1903; *Kartell-Rundschau*, 1903, p. 817; *Kölnische Ztg.*, July 7, 1903.

asserted also that they have a solid value.[1] At any rate, the extent of the fields makes it a very difficult if not impossible task to prevent the re-establishment of serious local competition.[2]

The negotiations for the completion of a cartell of coal dealers on the Rhine was brought to a successful conclusion at about the same time. The cartell embraces all dealers taking over 50,000 tons per annum.[3] It is reported, also, that a deal has been put through with the shipowning mines which will exercise a pretty complete control of the shipping business on the Rhine.[4] This was used as a club, it is said, to compel Haniel to come in.

The New Agreement. The new compact or agreement provides for a radical amendment of the old one in several respects: in the definition of the functions of the cartell, in the regulation of participation, in the assessment of the Umlage, in the treatment of the consumption of the Hüttenzechen as to sale and Umlage, in the relation of the coke and briket producers to the coal producers, and in the provision for competition. The text of the new agreement has not yet been published, but fairly complete and apparently trustworthy accounts of all important changes, apart from those of organization, are contained in a number of articles in the press and industrial journals.

In some respects the most extraordinary feature of the new cartell is the definition of functions, because this could not have been predicted from anything in the previous history of the organization. Instead of limiting the activity of the cartell to the "purchase

[1] *Tageblatt*, June 26, 1903; *Kölnische Ztg.*, July 7, 1903.
[2] *Tageblatt*, July 14, 1903.
[3] *Id.*, Dec. 24, 1903; Dec. 30, 1903.
[4] *Frankfurter Ztg.*, Oct. 7, 1903.

and sale of coal, coke and brikets," its objects and functions are enlarged, and defined as follows: "The object of the enterprise is the purchase and sale of coal, coke and brikets, the acquisition of mining lands and mining shares, the operation of enterprises of all kinds, which are concerned with the storage, the sale, and the promotion of mining products, as well as the participation in such enterprises."[1] The significance of this clause is very great. A cartell whose central government has large possessions, has already half accomplished the metamorphosis to a consolidation. It is understood among some of the leaders in the industry to be a step towards a so-called fusion or trust.[2] It appears that originally it was contemplated that the cartell should obtain the means to extend its activities in the manner described above through an increase in its capital stock,[3] but this was given up in favor of a method more in harmony with the existing system, namely, assessments on the members. It is provided, however, that if the amount expended for these or other purposes of the syndicate requires an assessment exceeding 3% of the total annual sales of the syndicate, consent to such extraordinary expenditure must be first obtained through a nine-tenths majority of the votes in the assembly of mine owners.[4] Among the immediate practical objects of this provision are supposed to be the acquisition by the syndicate of an extensive control over new coal fields and over the coal transportation interests on the Rhine.[5]

[1] *Kölnische Zeitung*, July 22, 1903.

[2] Commenting on the meaning of the new agreement the *Frankfurter Zeitung* says: "Schliesslich marchiren wir eben doch auf den Trust los." Sept. 16, 1903.

[3] *Kartell Rundschau*, 1903, pp. 741–2.

[4] *Kölnische Ztg.*, July 22, 1903; *Tageblatt*, July 7, 1903.

[5] *Id., Ztg.*, July 7 and 22, 1903.

A second very important change in the agreement, and one which most affects its outward form, is contained in the articles which provide for the merging of the coke syndicate and the briket combination in the coal syndicate. All the particulars of these changes have not been divulged, but the chief facts seem to be substantially as follows. The former organization of the coal syndicate remains practically intact with Vorstand, Beirat and assembly of mine-owners, and in general, has the same functions as before, as well as a superior authority in general matters over the affiliated coke and briket works. On the other hand, the general organs of the coke and briket cartells disappear along with their independent legal existence. But, when a matter comes up for consideration which concerns the particular interests of the coke and briket producers, such as the allotment of participation figures or the election of the "coke commission" or "briket commission", only the representatives of the producers of those commodities, respectively, have voice or vote. The two "commissions" mentioned above become the special organs of control for their respective interests. Each of these commissions is composed of eight members, comprising six technical experts and two merchants. But, although the coke or briket producers decide in general on the quotas of production and the amount to be marketed, the amount to be produced must conform to the general scheme of production established for coal, and is also subject to reduction on the demand of the assembly of mine-owners.[1] Concerning this feature of the agreement the *Kölnische Zeitung* says: "In this affiliation, which has been frequently suggested before in other forms, there exist

[1] *Kölnische Ztg.*, June 19, 1903.

doubtless great advantages. The oversight of the whole coal and coke market is materially facilitated, the development of the market situation may be judged more correctly, and shipment can be systematically, and therefore, more cheaply regulated."[1]

The rules regarding participation are modified in important particulars although the general scheme remains the same. The coal mines start with the allotted participation figures possessed before October 1, 1903, under the preceding agreement. For the Hüttenzechen, on the other hand, as well as for new members not connected with smelters, special agreements in respect to initial quotas are provided. Voluntary reduction may be made in the participation figures, but not for merely temporary purposes. The most important provision, of course, is that respecting an increase in participation. The rule is that when the situation of the market permits an increase of sales, the total available increase in production so occurring shall be allotted proportionally among the several members. Such grants of participation are not acquired as a permanent right, unless the mines obtaining the same actually supply the quantity allotted for six months following. Hence the only condition under which a mine can get an increase of participation are, (1) a general increase of participation in consequence of an increased demand, or (2) the purchase of mines which have rights of participation in the syndicate.[2] For coke the rule remains

[1] *Supra*, June 19, 1903.

[2] *Id.*, July 22, 1903. This journal prophetically remarks (see p. 109): "Nach Inkrafttreten des neuen Vertrags alle minderwertigen Zechen einfach wegen ihrer Beteiligungsziffern ein willkommenes Kaufobjekt für die kapitalkräftigen Zechen selbst dann sind, wenn derartige minderwertige Zechen künftighin stillgelegt werden."

substantially as before; no increase of participation unless there is technical possibility of production, and the exercise of the right would not involve a reduction in the output of other works, and, further, this must be in agreement with the general scheme for coal production.[1] In case a syndicate mine establishes a coke plant, the initial participation allowed is restricted to 100,000 tons; similarly for a new briket plant, the limit is 72,000 tons.[2]

A vital feature of the scheme of participation, as established in the new agreement, is concerning the exclusion of coal consumed at the mines and works (Selbstverbrauch) from the reckoning of participation. The significance of this matter has been sufficiently discussed above; the new rule is substantially as follows. Excluded from the reckoning of participation, and also from the assessment of the Umlage, are the coal, coke and brikets used in the mines, in smelters in possession of the mining company at the time of the formation of the agreement, in cokeries, tar distilleries, gas generators and other gas works, briket works and brick works, in so far as these are operated in immediate connection with the mines by the owners thereof.[3] Two points should be emphasized here, (1) new acquisitions of mines by blast furnaces, will not have this privilege, and, (2) the now existing Hüttenzechen will have a great advantage in the future in expanding their coal production compared with companies engaged solely in mining.

Mines producing less than their allotted share are al-

[1] *Supra*, June 19, 1903.

[2] *Id.*, July 22, 1903.

[3] *Id.*, July 22, 1903; *Industrie Zeitung*, May 15, 1903.

lowed a compensation, and mines producing more than the same are obliged to pay a contribution, which is fixed at a mininum of 1.50 marks per ton.[1] The Umlage, as stated above, is limited to 3 per cent., unless an extraordinary majority of nine-tenths is obtained for a higher assessment. It is specially provided that where the syndicate has been compelled to sell coke or brikets below the accounting price, the difference shall be made up to the mine supplying the same, for which the means shall be acquired by the assessment of the coke or briket producers respectively.[2]

The selling functions of the syndicate under the new agreement remain practically unchanged. Excluded from sale by the syndicate are all coal, coke and brikets destined, (1) for the mines and other works whose consumption is reckoned as Selbstverbrauch, (2) for neighborhood sale, excluding the regular supply of works, (3) for officials and employees, (4) for charitable purposes, and (5) for gas coke.[3]

Certain provisions are introduced for the protection of the syndicate against outsiders. An extraordinary feature is the rule that for the purpose of meeting competition those provisions which hinder the successful conduct of the business may be temporarily suspended. A three-fourths vote is necessary to effect this.[4] It is also provided that the members of the syndicate may not sell any mines or coal fields to non-members without the assent of the assembly of mine-owners. Further, outsiders may not be permitted to utilize the shafts of

[1] *Kartell-Rundschau*, 1903, pp. 741–2.

[2] *Kölnische Ztg.*, June 19, 1903.

[3] *Id.*, July 22, 1903.

[4] *Id.*, July 22, 1903; *Industrie Ztg.*, 1903, p. 219.

a syndicate member for getting out coal, etc., unless they acquired the right prior to the establishment of the new agreement.[1]

Finally, we may note the provision that differences of opinion between the contracting parties concerning the interpretation of the treaty are to be settled by a court of arbitration.[2]

A consideration of the new compact makes it clear that another step has been taken in the gradual evolution of the industry towards unity and economic power. The *Kölnische Zeitung* says: "there can be no doubt that the syndicate, with the help of the provisions of the new agreement, can control the coal market far more effectively than hitherto, and hinder the emergence of fresh competition much more easily."[3] That this is the general expert opinion is evidenced by the advance of coal stocks, as soon as the success of the new agreement seemed assured.[4]

Recent Developments. In general it is too early to speak of the effects of the new agreement in practical operation, nor is it within the scope of this inquiry to discuss the operations of the cartell since 1902, but there have been some developments in the most recent period, which, on account of the character of the problem and the interest it has excited, demand at least a brief reference. The question is concerning the purchase and abandonment of several unprofitable mines and the consequent loss of employment by laborers and economic injury to those communities

[1] *Kölnische Ztg.*, July 22, 1903

[2] *Id.*, May 11, 1903.

[3] *Id.*, July 22, 1902.

[4] *Tageblatt*, Sept. 16, 1903.

wherein the mines are located.[1] According to an official statement, recently made in the Abgeordnetenhaus by Minister Moeller, there have been in all, since the formation of the new agreement, ten mines sold, or about to be sold. Including one mine previously shut down, the total number of employees affected was 12,500, and the total production about 2,530,000 tons. Of these only three mines proved profitable in recent years,[2] and in two of these cases the shut down is only for small shafts belonging to the mines, while for the third it is only temporary. The eight unprofitable mines produced about 1,330,000 tons in 1902, and paid 2¼ million marks in assessments.[3]

The dismantling of these mines appears to have created some excitement in the coal region, in the press and in the German and Prussian legislatures. Interpellations were brought in, in both the Reichstag[4] and the Abgeordnetenhaus. In the latter assembly Minister Moeller replied, and said that, while the information in the possession of the government did not show actions of the unjustifiable and injurious character alleged, particularly as to the non-employment and destitution of mining labor, yet it was the purpose of the administration to send a commission to the Ruhr to inquire into the matter. He characterized the whole agitation

[1] Hamburg u. Franziska (purchased by Gelsenkirchen), Stock u. Scherenburg (by Deutschland), Bommerbänker (by Mt. Cenis), Gen. Blumenthal and Alstraden (by Hibernia), Hasenwinkel (by Friedlicher Nachbar), Julius Philipp (by Arenberg'sche, A. G.), Bochumer Koks u. Kohlenwerke (by Constantine d. Grosse), Maria Anna u. Steinbank, Eiberg and Bickefeld. *Frankfurter Ztg.*, Jan. 1, 1904; *Tageblatt*, April 25, May 1 and 5, 1904.

[2] Hamburg u. Franziska, Eiberg and Hasenwinkel.

[3] Report of debate in Abgeordnetenhaus, *Tageblatt*, April 16, 1904.

[4] *Id.*, April 22, 1904.

as an unreasoning panic, like that in a theatre when somebody cries fire.[1]

Whatever may have been the local hardship occasioned, it is quite beside the mark to lay the blame on the syndicate. Dr. Beumer remarked in the Reichstag that the unprofitable mines, except for the syndicate, would have been obliged to shut down long ago.[2] Herr Kirdorf pointed out, further, in his address in the annual meeting of the syndicate, that no power was conferred on the syndicate to forbid the transfer between members, and he had, therefore, refused to interfere, but, on the other hand, he had used his influence as a member of the Dortmunder Verein to induce those who had such action in view to carry out their plans gradually, and with due regard to other interests.[3]

In the discussion of the production policy of the syndicate (Part IV, Ch. I), this general problem is given due consideration, and the more recent events described here demand no further comment, nor an alteration of the conclusions arrived at there.

[1] *Supra*, April 16, 1904.

[2] Debate in Abgeordnetenhaus, *Supra*, April 17, 1904.

[3] Bericht d. Kohlen Syndicat, 1903, Anhang.

CHAPTER II

THE UPPER SILESIAN COAL CONVENTION

The coal convention of Upper Silesia (Ober. schlesische Kohlenkonvention) was formally organized in 1890 and has been renewed from time to time since, generally for three year periods. The present agreement runs until October 1, 1904, and its continuation thereafter is generally expected.[1] In form it is a simple mutual agreement without notarial certification. Originally it was merely a price cartell, at present, it is both a price and a sale cartell.[2] There is no agreement with Lower Silesia, although there have been some dealings between them.[3] The convention embraces about 94.3 per cent. of the private output of the district and 74.5 per cent. of the total output.[4] There are seventeen members in the convention including two firms of coal dealers who have no vote.[5]

Organs and Powers. The principal features of the agreement are as follows.[6] The general power of the convention is vested in a plenary assembly (Plenarversammlung). The plenary assembly is composed of representatives of the mines who are allowed one vote for every 100,000 tons output or fraction thereof. The mines under one administration are reckoned solidly. Besides the regular annual meeting, special meetings

[1] Enquete, pp. 334, 338.

[2] *Id.* pp. 334, 338, 327.

[3] *Id.* p. 358.

[4] *Id.* p. 556.

[5] *Id.* pp. 337, 555.

[6] The authority for the following analysis is the text of the Convention treaty unless otherwise noted.

may be called by the chairman of the convention, and such special meetings must be called if one-fourth of the vote representation demand it. For the determination of various questions, different majorities are required. Among the most important are the following:

(1) A majority of three-fourths is required for (§ 13)

(a) changes in the statutes where not otherwise provided for,

(b) changes in the normal minimum prices and price differences for different brands, sorts and railway differentials,

(c) exceptional rules for particular mines,

(d) possible termination of the convention before the time fixed.

(2) A two-thirds majority is required for,

(a) changes respecting the shipping permits,

(b) changes respecting exceptional prices and prices for distant markets (Fernegebiete).

(3) A simple majority is required for all other determinations, especially elections, fixing participation figures, disposal of property of the convention, provision for possible assessments, etc. (§ 13).

The general representative of the convention, both for dealings with outsiders and with individual members is the chairman who is elected by the plenary assembly, together with two substitutes. These three form an executive committee which supervises and counsels the executive officer. This executive officer or business manager is also appointed by the plenary assembly, and it is his right and duty to attend and participate in its meetings. There is also an auditing board of two, chosen by the plenary assembly to audit the annual report. The plenary assembly meets

regularly every year in October; it hears the report, receives the accounts, fixes the budget for the ensuing year and elects officers, (§ 14). It will be seen that the general assembly has practically all the power and does all the work.[1]

The two principle features of the treaty, apart from the organization of the government, are the rules regarding prices and production. These can be changed by the general assembly, but the scheme, as fixed in the treaty, though undergoing some important quantitative changes, preserves its general character. The most original and the most important feature of the convention is the price regulation.[2]

The general principle of the Silesian convention is that minimum prices only are fixed; the individual mines may sell on their own account to whom they will and at any price they can obtain at or above the minimum price. Generally they sell above it. There is of course no selling bureau for the convention like the Rheinish-Westfälische Kohlen Syndicat.[3] From the general provision that coal must not be sold below the minimum price, there are two exceptions: (1) all coal sold to the mining and smelting works of Upper Silesia, (2) unseparated coal under fifteen mm. in size.[4] The provisions of the convention agreement provide three norms for the determination of prices: (1) the brand (mine), (2) the sort (size), and (3) the location (freight differential).

[1] Enquete, pp. 334–5.

[2] No changes in prices were made in the first seven years of the convention. The present prices are slightly below those given in the published form of the treaty. *Id.* pp. 338, 360.

[3] *Id.* pp. 327, 329, 335.

[4] *Id.* pp. 328, 339, 542.

(1) In respect to the brand, the mines belonging to the convention are grouped and a reduction fixed (compared with the first class) as follows:

Class I a.	normal = 50 pf. per Zentner[1] for the best quality (in 1901).
b.	1 pf. per Zentner reduction.
II a.	3 " " " "
b.	4 " " " "
III a.	8 " " " "
b.	10 " " " "

(2) In respect to the sort, the coal is divided into three classes, viz. (a) separated coal, (b) run of the mine, (c) small coal. No other sorts may be sold. Class (a) includes coal mechanically separated by passing through gratings of not less than sixty mm. This coal is further separated and classified in seven sub-classes according to size. The best quality (Stück and Würfel) is sub-class α which is obtained by passing the coal through a grating of not less than sixty mm. This furnishes the standard for the price scale. The six other classes are divided according to the size of the coal with price reductions as follows:

Sub-class β_1	(35–40 mm.),	5 pf. reduction.
" β_2	(30–35 "),	7 pf. "
" γ_1	(25–30 "),	9 pf. "
" γ_2	(20–25 "),	15 pf. "
" δ_1	(15–20 "),	19 pf. "
" δ_2	(10–15 "),	23 pf. "
" $\zeta_1 \zeta_2$	[under 10 "],	29 pf. "

Coal under 15 mm. not separated further is not regulated with respect to price. Class (b) includes "run of the mine" strictly, and is allowed a price reduction of 9 pf. Class (c) includes the unseparated small coal (Kleinkohlen), viz. the coal remaining when the Stück and Würfel are separated by gratings of not more than 70 mm. For this coal a price reduction of 17 pf. is

[1] Zentner = 50 kilos; 20 Zentner = 1 metric ton.

allowed. There are some further minor points in this classification that need not be considered here. (§ 3)

(3). In respect to location and freight differentials the following price regulations are made. Kattowitz, a central point in the coal district, is made the price basis, *i. e.* ± 0. The regions to which the coal is sent are divided into four divisions, and for each division, the mines are distributed into appropriate groups with respect to that market, and a freight differential allowed according to the distance. This freight differential is reckoned plus or minus the freight-base Kattowitz.[1] The four market divisions are:

I. Total inland market: there are 7 groups here with differentials ranging from +1½ pf. to −1½ pf.

II. Northwest Austria: there are ten groups here with differentials ranging from +1½ pf. to −4 pf.

III. Other Austria, part of Hungary, and also Roumania and Russia: there are fourteen groups here with differentials ranging from +2½ pf. to −5 pf.

IV. Other Hungary: there are nine groups here with differentials ranging from +1½ pf. to −6 pf. (§ 4)

The prices so established (net minimum prices) can be departed from in only three cases: (1) sales to Upper Silesian mining and smelting works, (2) sales to exception regions (Ausnahmegebiete), (3) summer sales. The last two exceptions are now to be considered. The exceptional regions are of two sorts. (1) The real exceptional regions, which are allowed to go in general 20 per cent under the minimum prices, viz. for districts a, b and c, which include approximately the stations on and near the Baltic and North Sea coasts, and Elbe stations from Magdeburg to Hamburg (also Great Brit-

[1] The area of the coal district is from 20 to 25 kilometers long by 8 to 10 kilometers wide. Enquete, p. 339.

ain). A special provision is made for (d) West Elbian points (except part of Dresden) for which all restrictions are removed. (2). The second rubric under the exceptional regions includes the so-called distant regions (Fernegebiete), for which a reduction of 2 pf. from the minimum price is permitted; they are approximately as follows, for districts A (East and West Prussia), B (Pomerania), C (the west, *i. e.*, west of a line through Fürstenberg i. M, Potsdam, Freiberg in Saxony, etc.; this seems to conflict with exceptions region d), D (water shipments from points on the Oder from Stettin to Frankfurt am/O., from points on the Warthe from Küstein to Landsburg and points on the Havel from Potsdam to Fürstenberg i. M.) (§ 6). This is a very complicated scheme (much more so in the original), but it shows in an interesting way the competitive regions. The regular reduction allowed for summer prices applies to sales between April 1 and August 31 of sorts not under 30 mm. The reduction is 3 pf. per Centner. For certain sorts which contain mixed sizes above and below 30 mm. special arrangements are to be made. The summer prices are also allowed in March and September for certain water shipments on the Oder and the Przemsa (§ 7). By exceptional regulations the minimum prices to Russia have sometimes been fixed lower than provided above and sometimes made entirely free.

We come now to the regulation of shipment which is in effect, a regulation of production. The cartell applies to,

(1) All shipments on the main-line railways.

(2) Such shipments on the local narrow-guage road as are destined to water shipment at the Klodnitz canal near Gleiwitz.

[1] Enquete, p. 357.

This includes all but about 20 per cent. of the total production of the convention mines.[1] The participation figures for the cartelled shipments are fixed annually for each mine (Verhältniszahlen) on the basis of the actual shipment of the preceding year, and in general these are the same. The participation figures are divided correspondingly into (unequal) quarterly participation figures. These are made the basis for the grant of the quarterly shipping allowances (Versandlizenzen) which are proportional thereto. If no shipping allowance is determined, the participation figure for that quarter stands instead. In case a mine, through interruption of production, did not have a normal output in a given quarter of the preceding year from which to reckon the participation and allowance figures then the general percentage of the convention may be taken as a basis instead. In general, the amount of the allowance figure is not given but a percentage plus or minus on the allowance of the previous year. Mines under the same administration can transfer their allowances. Deferment of shipment may be granted by the plenary assembly to the extent of five per cent. from one quarter to the succeeding one; a more extensive modification of the rule requires a three-fourths vote. In case the actual shipment of a mine in a given year is less than its participation figure in the business year 1901–02, it can demand the latter as a basis for reckoning its current participation and allowance. Some further minor provisions are made respecting allowances in case of interruption of operations through accident etc. (§ § 8, 9, 10, 11, 12). In the early years of the convention, special arrangements existed for the new and undeveloped mines, but now the general regu-

[1] Enquete, p. 328.

lations apply to all.[1] It may be mentioned here that the shipping allowances have been reduced for only two years (1892 and 1902), and all limitations on shipment were removed in 1900 and the first quarter of 1901.[2]

Further important provisions of the treaty are as follows: Exceptions to rules may be allowed to individual mines by a three-fourth vote of the plenary assembly when the enforcement of the same would cause disproportionably great injury or with regard to the necessities of competition with non-convention mines (§ 15). Fines are provided for the non-fulfillment of the terms of the treaty. (1) In the case of sales below the minimum price, the plenary assembly has the right to assess the damages caused thereby up to an amount equal to the difference between the actual proceeds on the quantity so sold and the amount that would have been received, if the regular price had been charged. For the determination of the fact of such a sale and the price of the same, the mines obligate themselves to allow the business manager of the convention a confidential examination of their books and papers. (2) In the case of shipments in excess of the shipping allowance, a fine is provided of 200 marks for every hundred tons so shipped. For the determination of the fact, the mines are bound to allow a confidential agent appointed by the plenary assembly to examine their books and papers, etc. (§ 16). As a matter of fact, it appears that the penalty for underselling has never been required,[3] but considerable amounts have been levied for excess shipments[4]. The amounts so obtained

[1] Enquete, p. 338.

[2] *Id.* p. 329.

[3] *Id.* p. 343.

[4] *Id.* pp. 340, 344.

have been used to pay (besides ordinary expenses) for building a house for the Oberschlesischen Berg- und Hüttenmännischen Verein, (300,000 m.), for improving the harbor at Oppeln, on the Oder (250,000 m.), a contribution to the technical school at Breslau (over 100,000 m.), experiments in heating (50,000 m.), etc.[1] Provision is made for assessments (Umlage), if necessary, to cover the costs of operation which are to be apportioned according to voting power (§ 18). New mines, acquired by the members of the convention, come under its provisions *ipso facto.* This includes new deep shaft mines, but they are not to be restricted in their shipments between Oct. 1, 1901 and Oct. 1, 1904 (§ 19). The provisions of the treaty are made binding for successors, together with the obligations incurred by the previous members, (§ 20).

The convention of Upper Silesia is evidently a much looser organization from a formal standpoint than that of the Ruhr. But as the mines are few and the owners intimately associated, the need of a closer organization is not felt.[2] It has been called a " family affair".[3]

[1] Enquete, p. 340.

[2] *Id.* p. 341 (Williger).

[3] *Id.* p. 342.

PART IV

ANALYSIS OF THE OPERATION OF THE CARTELLS

CHAPTER I

PRODUCTION OF COAL

The first topic, logically, in the examination of the cartells is production. We should consider first, the quantity produced by the cartells as compared with the total production and in relation to the demand, secondly, the policy of the cartells in the regulation of output, and thirdly, the relation of the cartells to the economy of production and quality of product.

The total production of Steinkohle in the German Empire in 1902 was 107,436,334 tons,[1] of which 100,115,315 tons were produced in Prussia. Of this latter amount, 58,626,580 tons were produced in the Ruhr district, or 58.56% of the total output of Prussia, 24,485,368 tons or 24.46% of the same in Upper Silesia and 9,493,666 tons in the fiscal mines of the Saar, or 9.48% of the total.[2] Or, taking these three chief districts together, we have an output of 92,605,614 tons, or 92.5% of the Prussian production. These proportions have been tolerably constant for the last ten years. The fiscal mines of the Saar embrace practically the whole output of that region, and act for all practical purposes as a cartell or rather a fusion or trust; hence in estimating the influence of combinations on production, prices, etc.,

[1] *Vierteljahrshefte*, 1903, II. p. 101.

[2] Bericht d. Kohlen Syndicate, 1902, p. 8.

they should be considered as occupying much the same position. The syndicate mines of the Ruhr produced 48,609,645 tons or 48.55% of the Prussian output (82.8% of the Ruhr production), the Upper Silesian convention produced 18,239,543 tons, or 18.2% of the Prussian output (and 74.4% of the output of Upper Silesia). Taking these three combinations alone, we have an output of 76,342,854 tons, or 76.2% of the total of Prussia. But the fiscal mines of Upper Silesia are practically pooled with the convention,[1] while the mines of the Wurm district are in close relations, not only with each other, but also with the Ruhr. Further the mines of Lower Silesia are all cartelled, and, outside of Prussia, in Saxony, is the cartell of the Zwickau mines. But simply adding the production of the Lower Silesian cartell and the fiscal mines of Upper Silesia to the three chief combinations named above, we have an output of about 85,760,000 tons or approximately 85% of the total Prussian production.[2] It would be fair to say, therefore, that at least 85% of the present production is in the hands of five organizations which, for most of their business, are governed by non-competitive principles.

The outsiders find their chief strength and significance directly in the territory of the strongest German cartell, viz. in the Ruhr. The total production of that region in 1902 was 58,626,580 tons, of which 10,016,-935 tons came from non-syndicate mines.[3] The mines in Upper Silesia not included in the convention, nor owned by the fiscus, had an output in 1902 of 1,094,-

[1] Enquete, p. 344.

[2] The fiscal mines of Upper Silesia produced 5,136,827 tons in 1902. Enquete, p. 556. The production of the Breslau district was 4,283,188 tons in 1901. *B. H.- u. S.* 1902, p. 3.

[3] Bericht d. Kohlen Syndicat, 1902, p. 8.

418 tons.[1] The considerable amount of non-syndicate production in the Ruhr loses a large part of its significance from the standpoint of competition when it is considered that the greater part of it belongs to blast furnaces and other consumers and does not come into the general market.[2] In Upper Silesia the deduction on this account is not so important.[3] Further, the convention does not regulate the whole of the output of its members, but only the main line shipments,[4] *i. e.* 59.1%. Nevertheless the control over production is fairly complete.

The first question that we have to ask concerning the policy of the cartells is their influence on the quantity of production. Experience shows that in a growing country, increasing, that is, not only in population, but also in industrial activity, the normal supply of wants must be met by a production that increases not only positively but relatively, compared with the increase of population. There is no known norm to measure the extent of this need, but a comparison with the population affords a useful guide, especially in connection with similar figures of other countries. The production of coal is to a considerable degree under the control of the pro-

[1] Enquete, p. 556.

[2] Five iron concerns own ten mines with a production of 3,512,711 tons, for each of which a contract exists that any surplus product shall be sold by the syndicate. (Hannover, Sälzer u. Neuack, Hasenwinkel, Maria Anna u. Steinbank, Engelsburg, Westende, Glückauf Tiefbau, Carl Friedrich Erbstollen, Adolf v. Hasenmann and Hörder). Besides these there are at least five other large mines belonging to iron producers with an output of about 3,493,875 tons which presumably do not sell much coal. (Hannibal, Deutscher Kaiser, Oberhausen u. Osterfeld, Hugo, Minister Achenbach). Steinkohlenzechen, pp. 100–1.

[3] One mine, "Consol. Hultschiner," output, 286,765 t., belongs to a smelting company. *Statistik Oberschl. B. u. H.* 1902, pp. 8, 25.

[4] Enquete, p. 345.

Year.	(1) Popula. of Empire in 1000.	(2) Production of Empire.		(3) Exp.	(4) Imp.	(5) Inland Consumption.		(6) Prussian Production: Chief Districts and Percentages.							
								Ruhr.		Ruhr Syndicate.		Fiscal Saar.		Upper Silesia.	
		1000 Tons.	Per Cap.	1000 Tons.	1000 Tons.	1000 Tons.	Per Cap.	1000 Tons.	Per Cent.	1000 Tons.	Per Cent.	1000 Tons.	Per Cent.	1000 Tons.	Per Cent.
1892	50,266	71,372	1.419	8,971	4437	66,838	1.329	36,969	56.30	------	------	6258	9.56	16,437	25.13
1893	50,757	73,852	1.455	9,677	4664	68,839	1.356	38,702	57.20	33,539	49.57	5883	8.70	17,109	25.27
1894	51,339	76,741	1.494	9,739	4806	71,808	1.398	40,734	57.66	35,044	49.61	6591	9.33	17,204	24.35
1895	52,001	79,169	1.522	10,361	5117	73,925	1.421	41,734	57.47	35,347	48.67	6886	9.48	18,066	24.88
1896	52,753	85,690	1.624	11,599	5477	79,568	1.508	45,008	56.98	38,916	49.26	7705	9.75	19,613	24.83
1897	53,569	91,055	1.699	12,390	6072	84,737	1.581	48,519	57.59	42,195	50.08	8258	9.80	20,627	24.48
1898	54,406	96,310	1.770	13,989	5820	88,141	1.620	51,306	57 28	44,865	50.09	8768	9.79	22,489	25.11
1899	55,248	101,640	1.839	13,943	6220	93,917	1.699	55,072	58 13	48,024	50.69	9025	9.53	23,470	24.77
1900	56,046	109,290	1.950	15,276	7384	101,398	1.809	60,119	58.96	52,080	51.08	9397	9.22	24,829	24.35
1901	56,862	108,539	1.908	15,266	6297	99,570	1.751	59,004	58.30	50,411	49.81	9376	9.26	25,251	24.95
1902	57,708	107,303	1.859	16,101	6426	97,628	1.691	58,626	58.56	48,609	48.55	9493	9.48	24,485	24.46

(1) Jahrb. d. Deutschen Reiches, 1903, p. 2.

(2) *Ib.* p. 46. Bericht d. Kohlen Syndicat, 1902, p. 11.

(3) *Dortmunder Jahrb.*, 1901, p. 581. Bericht d. Kohlen Syndicat, 1902, p. 11.

(4) *Dortmunder Jahrb.*, 1901, p. 581. Bericht d. Kohlen Syndicat, 1902, p. 11.

(6) *Ib.* p. 8.

ducer as respects the amount (though not so exactly as most manufactured products); the question here is, have the cartells limited production unduly, as their opponents often claim.

This table shows a very considerable increase both in production and consumption *per capita*; respectively, 23.7 per cent. and 21.4 per cent. The increase in production has been distributed with remarkable evenness among the different districts, but it is noticeable that the Ruhr syndicate showed a relatively greater increase until the crisis, and since then, a decline. The *per capita* consumption in Germany does not approach that of England, but it greatly exceeds that of France; the two countries with which it can be most fairly compared. A recent English table gives the consumption of various countries from which the following figures are taken.[1]

	United Kingdom.	*Germany.*	*Belgium.*	*France.*	*United States.*
1883	3.79	1.08	2.45	0.81	1.91
1886	3.50	1.11	2.22	0.74	1.75
1890	3.81	1.30	2.68	0.91	2.23
1893	3.30	1.32	2.35	0.89	2 43
1894	3.75	1.35	2.56	0.94	2.22
1895	3.75	1.38	2.55	0.95	2.46
1896	3.82	1.47	2.65	0.98	2.41
1897	3.87	1.54	2.70	1.02	2.47
1898	3.83	1.58	2.75	1.06	2.65
1899	4.05	1.66	2.83	1.11	3.00
1900	4.08	1.77	2.95	1.19	3.08
1901	3.89	1.71	2.81	1.15	3.29

The consumption of England is very large but, apparently, is not increasing. Germany, on the other hand, has recently begun the development of industries on a large scale and a rapid advance in the *per capita* figures of coal consumption must be regarded as a normal circumstance. That the cartells have done their share towards supplying this need may be seen from the following table:

[1] Coal Tables, Board of Trade, 1901, pp. 32–3.

Year	Ruhr Syndicate.				Upper Silesia.			
	[1](1) Produc'n.	(2) Export	Consumption.		(3) Product'n.	(4) Export	Consumption.	
	1,000 t.	1,000 t.	1,000 t.	% of Total.	1,000 t.	1,000 t.	1,000 t.	% of Total.
1896	38,916	4,688	34,328	43.1	19,613	4,613	15,000	18.8
1897	42,195	4,964	37,231	43.9	20,627	4,483	16,144	19.0
1898	44,865	5,644	39,221	44 5	22,489	4,930	17,559	19.9
1899	48,024	5,648	42,376	45.1	23,470	4,909	18,561	19.8
1900	52,080	5,861	46,219	45.6	24,829	5,516	19,313	19.0
1901	50,411	6,063	46,348	46.5	25,251	5,279	19,972	20.0
1902	48,609	6,870	41,739	42.7	24,485	5,076	19,409	19.9

The Ruhr Syndicate supplied the domestic market at an increasing ratio until 1900, but after that the production declined and the export increased. This is the proper theoretical policy of a cartell, *i. e.* the accommodation of supply to demand in the domestic market. The same tendency appears in Upper Silesia. The quantity of coal produced and offered for domestic use seems to have been, in general, large enough to cover all reasonable demands. Raffalovich, indeed, thinks that production has developed too fast, and that it exceeds the present power of consumption,[2] and Calwer, writing in 1901, says that it will soon be greatly in excess of the power of consumption.[3] Both of these writers are opponents of the cartells.

In some respects, the problem of the accommodation of supply to the demand is much simpler for coal than for many manufactures, for example, iron, because the uses of coal to a considerable extent are of a tolerably constant character and not very elastic. This is true, for example, of house-heating, lighting, locomotive consumption, etc., while industrial consumption is so varied

[1](1) and (3) Bericht d. Kohlen Syndicat, 1902, p. 8. (2) and (4) Enquete, pp. 280, 557.

[2] Raffalovich, p. 65.

[3] Calwer 1900, p. 8- ; *Cf.* also X Commission, p. 10.

that only the severest shock can greatly curtail its use. Indeed one of the chief difficulties to contend with is the seasonal variation.[1]

In the case of coal, the difficulties of accommodating supply to demand are rather in production. The coal deposits are not absolutely known quantities in many cases nor capable of extraction according to absolute calculations of time and labor; the seams may thin out unexpectedly; the progress of mining may be interrupted by flooding, squeezes, explosions, etc. The development of new shafts and workings often necessitates an interruption of regular mining. In a great mining district, the calculation of the effects of even the calculable events is not a simple one. Other technical difficulties occur in the productive process, notably, strikes of miners, car famines, low water in canals and rivers or the freezing of the same, which either prevent the calculated output or shipment. The checking of shipments through lack of storage space may lead to a necessary retardation of production. Storage, moreover, cannot be increased indefinitely, because coal held long in storage suffers a serious deterioration in power. These and other circumstances of the industry have an immediate and practical bearing on the question of supply, and at some critical junctures they are of capital importance.[2] Labor difficulties, strikes, shortness

[1] In the Convention of Upper Silesia they attempt to counteract this by price reductions during the summer months. Enquete, p. 357.

[2] Owing to these interruptions, the Ruhr syndicate in 1899 established a standing committee to have the oversight of the question of disturbances to production. *Industrie Ztg.*, Jan. 25, 1889. Car famines are likely to occur, especially in the autumn with the movement of the beet crop, and in the winter in consequence of snow storms. The freezing of railway lubricants in Dec., 1899 seems to have been an important factor in the coal famine. See *Stahl. u. Eisen*, 1900, pp. 155–8.

of hands, "blue Mondays" etc. seriously interrupt work. There has been no strike of importance in the Ruhr, however, since 1889.

The output cannot be determined exactly, therefore, by any mine or combination of mines,[1] but it can be determined probably quite as accurately as the demand. For the estimate of the demand, historical and statistical data are of primary value. There are three important factors which enter further into the calculation, namely, the weather, the industrial situation and coal imports. In Silesia the weather is the dominant factor, in the Ruhr the *conjunctur*,[2] and in Hamburg, probably, the imports. The regulation of production is accomplished in the Ruhr syndicate by a careful estimate of the productive capacities of the various mines, and the allowance of an ideal figure of participation (quota) which furnishes the base for the actual allowance. Where these calculations have been made on an inadequate estimate of demand, they have always been increased. Within the limits set by its price policy the syndicate has, naturally, always endeavored to satisfy the demand. In 1899, when the home demand proved stronger than was anticipated, the contracts on foreign orders were partly filled by coal bought abroad in order to release as much as possible of the local production for the domestic market.[3] The participation figures allotted to the mines might be greater or less without affecting the theoretical operation of the syndicate simply by changing the contraction or proportionate

[1] And especially not by the cartells when they do not control the whole of the production. *Cf.* Kirdorf, *Cent. Verband, D. I.*, 1901, p. 245 ; Denkschrift, pp. 8–9.

[2] Renauld, p. 76.

[3] *Bochum, Hk.*, 1899, p. 52.

reductions of output. Historically, however, and practically, they are estimates of the actual capacity (in some cases past capacity) of the mines, the combination having been formed originally on the principle that each mine ought to participate in the sales in proportion to its capacity. With the course of time, some mines acquire a greater potentiality of production while others become relatively exhausted; in the first case, they may demand an increase in their allowance, which must be granted if the conditions of the market justify it, in the second case, however, they cannot be reduced.[1]

The determination of a participation figure in itself carries with it the principle of restriction of output, and it was originally so intended independently of the imposition of contractions of the same. This would take effect principally through preventing a scramble for the increase of production. But it was not intended, on the one hand, to absolutely prevent an increase of capacity, nor on the other hand, to allow in every case the complete use of the capacity developed. The first statement is shown to be true by the fact that the participation figures have been increased, from 33,575,976 tons at the organization of the syndicate, to 62,196,437 tons at the beginning of 1903—an increase of 85.25%.[2] The second statement is proved by the frequent contractions of production.

The rapid increase of the participation figure was stimulated, and indeed made possible, by the extraordinarily favorable *conjunctur*. The following table shows the development of these quotas. The participation figure may be taken at the yearly rate at a given day, or

[1] *Cf.*; *Central Verband D. I.*, 1901, pp. 231–2.

[2] Bericht d. Kohlen Syndicat, 1902, p. 6.

at an aggregate of the changing monthly allowance throughout the year. The second quantity forms the basis for actual output and contraction, and it is sufficient to give that here :[1]

	Tons.		*Tons.*
1893	35,371,917	1898	49,687,590
1894	36,978,603	1899	52,397,758
1895	39,481,398	1900	54,444,970
1896	42,735,589	1901	57,172,824
1897	46,106,189	1902	60,451,522

The participation figures are not only often in excess of the capacity of individual mines ; but this is true in general for the whole cartell, first, because there are practically always some interruptions to their continuous exploitation, and secondly, because they often obtain allowances in excess of what they can ordinarily produce. Some mines, on the other hand, have been able to increase their capacity beyond the amount of their participation figure and, for one cause or another, have not procured an increase of the same. These, in an emergency, are able to produce more than their prescribed quota, and sometimes they have the opportunity to do so. Thus in 1898, it is reported that some mines were far behind their quotas while others were producing in excess.[2]

The syndicate aims to make coal mining profitable. It is not opposed to an increase of the participation figures and of production when that is a profitable policy ; on the other hand, it does not aim at the greatest production technically possible under the existing conditions. This is sometimes held up as a duty of the syndicate, but such a claim is a palpable absurdity. According to the same principle, it might be demanded that the number of mines in the coal fields be doubled,

[1] Bericht d. Kohlen Syndicat, 1902.

[2] *Industrie Ztg.*, 1898, p. 491.

quadrupled, etc., in order to produce more. This would be technically possible, but economically, it would be very foolish and wasteful. It may be the duty of the syndicate to increase the productive capacity under given conditions of market and cost of production, but exactly these circumstances may require it to contract production. Since the development of productive capacity, through the individual interests of the mines, has always tended to increase faster than the demand, the syndicate does not find it necessary to stimulate the movement; on the other hand, it is often compelled to check this movement in the interest of the whole. This is accomplished through the system of contracting the output, that is, allowing a mine to produce only a percentage of its theoretical capacity. This is an indispensable function of the syndicate. The contraction is generally expressed in a percentage which is to be deducted from the participation figures, but it is actually formed on an estimate of what quantity can be disposed of under certain presuppositions as to price. Thus it is officially explained that in the first quarter of 1901 the participation figures amounted to 14,007,000 tons; while it was estimated that there was an opportunity for sale, (under a tacit assumption as to the price scale, of course), of 12,600,000 tons. On this basis a contraction of 10% was in order.[1] In this case, as in every other, the contraction was not irrevocably fixed, that is, if the market permitted it, nothing prevented the syndicate from increasing production and sale. As a matter of fact, it has generally been true that the pre-determined or projected contraction was greater than that actually required and put into effect. The contraction is generally determined

[1] Denkschrift, p. 17.

for a month or for a quarter but sometimes for a longer period. Taking the yearly averages, the projected and actual contractions have been as follows:[1]

	Projected Contraction.	*Actual Contraction.*
1893(5 months)	12.00%	2.44 %
1894	11.75 "	4.98 "
1895	12.08 "	10.45 "
1896	12.50 "	8.705 "
1897	0.83 "	6.038 "
1898	8.55 "	7 50 "
1899	3.75 "	6.33 "
1900	0.00 "	4.34 "
1901	13.75 "	11.83 "
1902	23.00 "	19.59 "

In the cases (1897, 1899 and 1900) where the actual contraction was greater than the proposed contraction, the cause was in the inability of the mines to meet the demands made on them. The actual contraction for each year varies considerably from month to month, and this without any corresponding change, or no change at all, in the plan of output. This is another illustration of the fact that the conditions of production are not perfectly under control. Although all limitations on production have been removed in the aggregate for twenty-five months (last ten months of 1897, last three months of 1899, and twelve months in 1900), in only two instances, namely, Nov., 1894 and Nov., 1900, has the actual output equalled or exceeded the participation figures. (See next page.)

The contraction of production has been a favorite subject of animadversion by hostile critics who find in it an attempt to create a scarcity value for coal. This, for example, is the attitude of Graf Kanitz. To the explanation of its apologists that this contraction means simply the accommodation of supply to the demand,

[1] *Reichstag*, 1902, p. 6139; Berichte d. Kohlen Syndicat.

MONTHLY CONTRACTIONS, RH.-W. KOHLEN SYNDICAT.

(IN PER CENT.)

Month	1894	1895	1896	1897	1898	1899	1900	1901	1902
Jan.	—	11.00	3.50	4.95	7.42	2.99	4.65	8.87	19.99
Feb.	1.39	8.00	10.38	3.56	6.14	1.50	5.46	8.30	21.45
Mar.	2.87	9.00	11.70	6.07	7.25	0.62	4.05	8.60	22.02
Apr.	10.91	13.00	11.85	9.31	11.99	8.53	6.85	10.63	22.35
May	7.00	14.00	11.44	6.82	8.73	8.35	4.45	9.21	18.17
June	5.50	14.00	11.51	8.09	8.48	7.48	5.54	8.33	20.52
July	9.00	14.50	10.91	7.36	7.05	8.12	5.25	13.72	23.37
Aug.	11.25	13.00	10.47	6.70	9.50	8.83	4.49	15.17	20.54
Sept.	5.50	15.00	8.20	5.61	8.69	7.10	4.49	14.15	20.29
Oct.	4.50	12.00	7.79	8.33	7.54	8.59	4.25	16.73	17.85
Nov.	+0.51	3.15	3.33	3.48	3.15	2.38	+0.57	12.25	12.52
Dec.	0.50	2.12	3.35	2.04	3.98	10.28	1.60	14.48	15.74
	4.98	10.45	8.71	6.02	7.50	6.33	4.34	11.82	19.57

Calwer, 1901, p. 100; Berichte d. Kohlen Syndicat, 1900–1902.

Graf Kanitz says that a greater sale could be made if they would lower their prices.[1] This answer is, *a priori*, a fair one in general, but, without anticipating the discussion of price policy too far, it may be observed that, though it is plausible, it is by no means conclusive, since the elasticity of demand must be considered before drawing a conclusion. The Denkschrift of the Verein answers this criticism respecting the syndicate's price policy in 1901 by the statement that the contraction was determined subsequently to the contracts of sale in which the price was fixed for the ensuing year, namely:—the contracts and prices were made in the autumn of 1899 and the contraction in December, 1900, for the first quarter of 1901; and it concludes, therefore, that the contraction "has nothing to do with the determination of prices."[2] This goes too far in the other direction, so far as it pretends to answer the general charge (though perhaps not for this or other particular occasions); because the very essence of the cartell is a

[1] Reichstag, 1901, pp. 1331–3, Feb. 12.

[2] Denkschrift, p. 8.

combination for the regulation of production and price, and the establishment of a high price may oblige them to make a heavy contraction, or the establishment of a heavy contraction may give them an opportunity to demand a high price. The two go, however, so to speak, hand in hand, even though they do not keep in step. But it should be remarked further, in regard to the syndicate's policy, that when the contracts already made at a fixed price do not cover the whole possible output, and when the outlets in the way of expor thave been availed of so far as practicable; it is not to be reproached for contracting the output rather than to supply late-comers at cut prices (as a means of selling a greater quantity); because this would put their previous, regular customers, whether producers or dealers, at an unfair competitive disadvantage. The policy of contraction, finally, is merely a common business practice put into operation by a method adapted to the cartell organization.

The fiscal mines do the same thing in the budget or *état*, for the ensuing year.[1] They estimate how much coal they should produce, not how much coal they will be able to produce at the limit of capacity. If the situation is encouraging, they may enlarge their plant and extend their operations, and this has been the case generally from year to year, but, if the mines are to be worked at a profit, and this is the principle purpose for which they are worked, they must have regard to the market, and diminish, or at least limit, the scale of their production if the situation makes it seem advisable. The contraction of production, therefore, is a perfectly normal and proper business method in itself, and not

[1] X Commission, 1901, pp. 11–12; Reichstag, 1902, p. 6139.

necessarily a means of extortion, though it might be perverted to that use by causing an abnormal scarcity. Cases of contraction must be judged on their merits and with reference to prices, costs and other material facts.

The regulations of the syndicate concerning the transfer of participation figures are of great importance. We may note, first, that the treaty provides that the rights of participation of a number of mines owned in common or operated in respect to sale as a unit are to be treated as a unit in respect to the supply of their quotas.[2] A combination of two or more independent mines for purposes of sale is sometimes found advantageous, because an interruption in production in one can be made up by an extra output in the other, etc.[2] Much more significant are the acquisitions of poor mines by rich mines with the sole purpose of succeeding to the rights of participation belonging to the latter, in order to transfer production to the richer deposits. A recent case of this sort was the purchase of the mine Steingatt by the Concordia A.G., and the shutting down of production in the former. Concordia calculated that its participation figure was 15% below its full capacity which the contraction existing at that time had made about 35%; and it was estimated that this involved an increase in the cost of production of 50 pfg. per ton. On the other hand, Steingatt was not

[1] Vertrag, Kohlen Syndicat, § 2.

[2] Such combinations exist or have existed, for example, in the Stinnes mines (Carolus Magnus, Friedrich Ernestine, Graf Beust, Matthias Stinnes, and Victoria Stinnes), between Lothringen and Graf Schwerin, between Louise Tiefbau and ver. Wiendahlsbank, between ver. Rosenblumendelle and Mülheimer Bergwerk, between Portingssiepen and Rheinische Anthracit and between Pauline and Richradt. *Dortmunder Jahrbuch*, 1901, p. 543.

profitable on account of water in the mine but nevertheless, possessed a participation of 216,376 tons. It was calculated that by taking over this right of participation the cost of production, for the whole of Concordia's previous output, would be reduced thirty-three pfg., while a further profit would accrue on account of the additional amount of production of about 1.95 m. per ton.[1]

The method of regulating output in Upper Silesia is similar, the cardinal difference being that the allowances granted are not for total output but for shipment on the broad guage railways. So far as this excludes the quantity used by the mines for their operation (Selbstverbrauch), this system is preferable. The quota for each member of the convention (Hauptbahn-Versandlicenz) is generally fixed quarterly,[2] but, outside of the regular apportionment, special licenses to ship may be given by the general assembly.[3] The contraction or expansion of shipping licenses is made on a percentage basis of the shipment of the preceding period. Since the beginning they have been reduced twice, namely, in 1892 and 1902, but in 1900 and for a part of 1901, the usual limitations on shipment were entirely removed.[4] For the mines severally, the percentage of the shipping license to the total output varies considerably, excluding three exceptional cases, the percentage ranges from 61.2 to 78.8.[5] (See table on next page).

[1] Enquete, pp. 39–41, 243–4. In the calculation of the value of Steingatt's participation the term of the syndicate treaty was of course an important factor, and also the probability of its renewal.

[2] *Id.* pp. 335, 337–8.

[3] *Id.* p. 335. This happens especially when the market proves slow to take certain sorts or brands. With respect to certain new mines in 1890 no limitations were placed at first on the right to ship, p. 338.

[4] *Id.* pp. 329, 338.

[5] *Id.* p. 555.

Concerns.	Output in 1902. Tons.	License 1902–1903. Tons.	Per Cent.
1. v. Giesche's Erben	2,660,432	1,995,583	75.0
2. Kattowitzer A. G.	2,426,329	1,660,613	68.4
3. Ver. Königs u. Laurahütte	2,410,439	1,675,405	65.3
4. Hohenlohe'sche	1,696,755	1,215,524	71.6
5. Schaffgott'sche	1,680,500	1,325,070	78.8
6. Fürstlich Donnersmarck'sche	1,304,053	940,202	72.1
7. Ballestrem'sche	1,203,981	742,740	61.7
8. Schlesische A. G.	1,058,183	648,841	61.2
9. Donnersmarckhütte	1,048,504	729,803	69.5
10. Grafen Donnersmarck'sche	1,016,764	577,220	56.8
11. Borsig'sche	907,448	440,589	48.5
12. Pless'sche	338,353	248,729	73.4
13. Emmagrube	257,493	160,392	62.2
14. Oberschl. Eisenbahn Bedarf A. G.	197,723	------	----
15. Trautscholdsegengrube	32,586	55,223	171.9
Total	18,239,543	12,415,934	Av. 68.6

Regularity in the occupation of the mines, according to their allotted participation, is a fundamental principle in the management of the Ruhr syndicate which controls, of course, the distribution of orders.[1] This is demanded for the most economical production as well as for a fair distribution of the business. In order to equalize any deficiencies which may unavoidably occur, the treaty provides that mines which fill more than their share of orders shall pay a fixed contribution per ton of excess into the treasury of the syndicate; while those that fill less than their share shall receive a compensation of equal amount per ton of deficiency. The amount of this contribution (or compensation) was fixed originally at 0.50 m. per ton, but in 1901, it was changed to 1.00 m. per ton.[2]

[1] Kirdorf, *Cent. Verband D. I.*, 1901, p. 35.

[2] Raffalovich, p. 17. In 1898 the excess production exceeded the deficiencies, so that only 16.42 per cent: of the contributions were exacted, since they sufficed to cover the deficiencies. In 1899 and 1900 neither contribution nor compensation was paid, because all the mines received all the orders they could fill. In 1901 and 1902, on the other hand, the full sum was collected and paid in each case. *Kartell-Rundschau*, 1903, pp. 101–2.

Some general economic questions remain to be considered respecting the productive features of the coal industry: first, the influence of the consolidation of mines, second, the economies effected by the cartells, and, third, the general effect of cartells on productive efficiency.

Both from the mercantile and technological aspects, it has been long recognized that there were considerable economies possible in the consolidation of mines. In the first category, it is evident that there are opportunities for saving in the salaries of administrative officers and salesmen, in better prices on large purchases of supplies and in the greater credit and power of large capital in various business relations. In the second category, without going into detail, it is evident that there are opportunities for economy in motive power, in the reduction of the number of shafts necessary for production and ventilation, in the disposition of the labor force at the points most needed—especially in the better opportunities to carry on development work or make repairs without discontinuing or interrupting production. Practical experience has tested the benefits of consolidations, and they have increased in favor.[1]

In consequence of these facts, in spite of an enormous increase in production, there has been a large decrease in the number of mines in Germany in the last thirty years.[2]

	Number of Mines.	*Annual Output, Tons.*
1871–5	629	34,485,400
1882	492	52,118,600
1892	423	71,372,200
1900	338	109,290,200

[1] *Bochum Hk.*, 1886, p. 9; 1898, p. 42.

[2] *Stat. Jahrb. D. R.*, 1902, p. 30. Steinmann-Bucher, Wesen, etc., p. 134. The movement in Braunkohlen is similar; thus there were 627 plants in 1891 as compared with 569 in 1900.

The figures for Prussia and for the Ruhr show, of course, the same movement.[1]

	Prussia
1862	434
1872	476
1887	357
1902	270
	Ruhr
1874	245
1889	168
1902	164

The following table shows the extent of administrative and technical consolidation in the Ruhr; that is the number of concerns and the number of mines classed according to output.[2]

Output. 1000 tons.	*Concerns.*	*Mines.*
0	9	10
Under 50	13	13
50–100	5	6
100–200	22	32
200–500	26	58
500–1000	23	35
1000–2000	10	7
2000–3000	1	0
3000–4000	1	0
4000–5000	1	0
Over 5000	1	0
Not given	5	5
Total	117	166

That the consolidation of adjacent mines for purposes of operation is of great advantage in the economy of production is shown by the larger output *per capita* for the large mines. Taking 148 mines of the Ruhr, for which the figures of production and the number on the pay roll is given for 1902, we have the following results:

[1] *B.-H. u. S.*, 1903, I, p. 34; Oldenburg, p. 277.

[2] Compiled from Steinkohlenzechen. Of ten mines reported as having no output, 5 were in process of construction, 1 being deepened, 4 shut down, which in one case was due to insolvency.

[1] *Output.*	*Number of Mines.*	*Output per capita.*
Under 50,000 tons	10	193.9
50,000–100,000	5	209.2
100,000–200,000	32	200.4
200,000–300,000	29	226.8
300,000–500,000	30	236.8
500,000–1,000,000	35	256.7
1,000,000–2,000,000	7	279.3

The same facts shown in the last two tables are found in Upper Silesia.[2]

Output.	*Concerns.*	*Mines.*	*Output per capita.*
Under 50,000	2	16	104
50,000–100,000	0	8	258
100,000–200,000	5	8	249
200,000–300,000	2	6	231
300,000–500,000	2	5	297
500,000–1,000,000	1	13	335
Over 1,000,000	11	7	346

There does not seem to be any evidence that the syndicate has had the effect of promoting consolidation,[3] except in a very secondary sense, as for example to acquire an increase in participation. On the whole it has tended to retard the normal movement towards consolidation. The Harpener consolidations occurred chiefly before the formation of the syndicate. The syndicate, by giving to each member an assured existence, removes cut-throat competition and the destruction of the weaker and poorer mines.

What the consolidation of single mines accomplishes in the way of administrative and technical economy finds its counterpart in the establishment of the cartell for a whole district. This is true especially of the

[1] Compiled from Steinkohlenzechen, 1903. One mine is omitted from the first class because of an abnormally low production.

[2] Compiled from *Statistik, Oberschles. B.-u. H.*, 1902, pp. 2–8; Enquete, pp 555–6. Each member of the convention is taken as separate concern.

[3] *Cf.* however, Kirdorf, *Cent. Verband D. I.*, 1901, p. 227.

mercantile side. Technical economies, through consolidation, find their limits in location of the mines, but the syndicate in its administrative and mercantile functions is capable of an almost indefinite extension and has the advantages connected therewith in unitary management and consolidated power. Great savings are possible in the conduct of sale through economies in agencies and advertisements and in price-cutting. It also facilitates a better distribution of orders with respect to the nearest source of supply, saving time and money on shipments. These facts are commonplaces of cartell policy, but it is impossible to measure them quantitatively.[1] Absolute consolidation, in most cases, would probably be even more effective in these directions.

Examining now the other side of the shield, we have to inquire whether there are any disadvantages in production in the cartell *régime*. It is a favorite indictment of the opponents of cartells that they tend to retard economic progress,[2] to petrify the industrial organization, and, in particular, to maintain in existence concerns that under competitive conditions would be unable to survive. The advocates of the cartells, on the other hand, generally deny these charges; but in some cases they have admitted them in part, and justified the cartells from the standpoint of "middle-class policy" in preserving a great number of small independent enterprises even though all of them are not the most economical or most progressive.[3] However laudable the wish to maintain these numerous "existences" may be from the humanitarian or social stand-

[1] Some writers doubt their importance. *Cf.* Vogelstein, p. 67.

[2] *Cf.* Phillipovich, I, p. 187.

[3] *Cf.* Sarter, p. 22; Enquete, p. 752.

point, their artificial sustentation at the expense of the consumer and to the detriment of the most efficient production must be in itself a most serious disadvantage.

The Ruhr syndicate is undoubtedly guilty, to a certain extent, of supporting this policy, but it would probably be an exaggeration to take it as a serious abuse. The evidence that such a condition exists in some measure is seen in the fact that used-up mines are purchased and shut down by concerns which wish to obtain their participation.[1] Liefmann thinks, indeed, that this process is better than the "selection" of free competition,[2] because the vendors of the exhausted mine do not suffer a total capital loss. The question, however, has nothing to do with the position of the sellers, who should have prepared for the final exhaustion of the mine by proper depreciation and reserve accounts.[3] The real test of the question is that of socially advantageous production. If a worthless mine commands a price, it must be due to a monopoly value in the right to participate in the syndicate sales, and this payment for the right to participate is made on the assumption that the prices, fixed by the cartell, make it valuable. Who pays in the end? There are two probable assumptions in theory; first, that the marginal cost of production is prevented from diminishing by the purchase under consideration, in which case it presumably comes out of the consumer; that is, a tax is levied on consumption for the benefit of the sellers

[1] See case of Concordia and Steingatt, mentioned above, p. 127. *Cf.* also, Nordstern and Helene, Mt. Cenis and Bommerbänker Tiefbau; Enquete, p. 151; Liefmann, Unternehmerverbände, p. 171.

[2] "Auf diese Art erfolgt der notwendige Ausleseprozess, sogar in noch vorteilhafterer Form als im Zustand der freien Konkurrenz." Liefmann, Unternehmerverbände, p. 171.

[3] *Cf.* Pohle, p. 122.

of the mine, the injurious effects of which to the consumer probably far outweigh the benefits to the sellers. Second, the purchasing mine may be so productive that the said purchase does not prevent the mine from continuing to produce below the margin of cost. In this case the direct concern of the public in the transaction is limited to the existence of a monopoly in general, and whether an unreasonable price scale exists in respect to the actual margin of cost. Serious danger from this cause exists only where such rights are acquired by mines of low productivity.[1]

The possible injurious effects from this policy are prevented from becoming serious through what may be called the heavy dilution of the original rights of participation; that is, the great increases in the total of the participation figure. The relative importance of the poorer mines, which cannot show the technical basis for a claim to increase in participation is thereby greatly diminished.

The mining industry of Germany, whether cartelled or not, cannot be justly accused of being behindhand in technical development—the Ruhr district least of all.[2] The profits of the mines depend on their keeping down the cost of the production, for which they are alone responsible, and this in general is a sufficient guarantee of technical efficiency. Another thing that tends to keep the competitive spirit alive among them is that, so far as practicable, coal is sold by the brand (*i. e.*, particular companies or mines) so that they are directly concerned in maintaining a good quality.

Probably under a competitive system the incentive in this last direction would be greater, and, indeed, in

[1] *Cf.* Liefmann, p. 272.

[2] Except, perhaps, in "machine mining."

recent years there have been some complaints respecting quality for which the cartells have been blamed,[1] but others assert that the quality has improved.[2] In times of great haste in production, as in the coal famine year, 1900, it is natural that less attention should be paid to quality. The wilful adulteration of coal with dirt, slate, *etc.*, sometimes practiced by dealers, has nothing to do with the cartells.[3] Complaints of inferior quality are found with respect to the output of the fiscal Saar.[4]

[1] Enquete, pp. 267–70, 374; X Commission, p. 7; Huber, pp. 125–6.

[2] Enquete, pp. 202, 269.

[3] As in Upper Silesia in 1900, by an irregular coal trade developed during the famine. *Cf. supra*, p. 507; X Commission, pp. 51 *et seq.*

[4] *Saarbrücken Hk.*, 1899, p. 7; 1900, p. 7.

CHAPTER II

COST OF PRODUCTION OF COAL

The cost of production is the indispensable basis for the criticism of price policy. In the cost of production of coal, there have been considerable changes in the course of the last half century. Since the end of the seventies, at least in the Ruhr, there has been an almost uninterrupted increase. With the progress of the mechanic arts, and the increase in the quantity of coal produced, the technical methods have been enormously improved both in power and refinement. The deep mining, which is predominant today in the Ruhr, requires a higher technique than the simple slope and tunnel mining with natural drainage and ventilation. A modern coal mine, to be in a position to work profitably, requires a very elaborate equipment above ground for conveying, pumping, ventilating, signalling *etc.*, including the investment of millions for steam and electrical machinery and housing for the same. Once the coal is brought to the surface an elaborate plant is required to sort and refine it. If, further, the company goes into the manufacture of coke and brikets, this means a large additional plant.[1]

[1] The importance of these items may be gathered from the following table of the book values of Dannenbaum, June 30, 1900, a mine of medium size, but well equipped.

Total value of mine and plant, 19,627,756 marks, of which:

Mining fields	4,951,377 marks.
Land (surface)	877,723 "
Mining construction	3,239,653 "
Surface buildings	1,979,951 "
Machinery	3,345,103 "
Railway	542,520 "
Inventory	1,478,885 "
Coke ovens (ordinary)	798,866 "
Coke ovens (by-product)	365,869 "
Benzol plant	112,500 "
Waterworks	151,596 "
Ventilation shaft	1,053,872 "

Dortmunder Jahrb., 1901, p. 31.

In general the change in technique has been caused, first, by the greater difficulties of deeper mining, second, by the superiority of mechanical over hand labor, and, thirdly, by the elaboration of the process and products. In some cases the change in technique stands for an increasing, in others for a diminishing cost. For example, where elaborate mechanical ventilation is required, in place of natural ventilation, the change in technique corresponds to an increased cost, so, again, where elaborate pumping systems displace natural drainage or simple methods. Sometimes there has been a contest, figuratively speaking, between the increasing difficulties of mining and the technical methods of overcoming them. Other changes in technique, however, correspond to diminishing costs—especially the substitution of mechanical, chemical and electrical agencies for human agencies. Such a change, for example, is marked by the introduction of explosives and drills instead of the pick, of steam or electricity in place of hand power or horses for cars under ground, of electrical elevators and aerial trams for cruder methods of conveyance. The elaborate washing systems for separating the coal correspond to an attempt to improve the product and to increase its value, as well as to cheapen the methods of sorting, while the plants for the by-products of coke manufacture, gas, tar, benzol, ammonium sulphate, *etc.*, correspond to new products and reductions in the cost of production of coke. In general, then, we may say that the increased investment in plant, *etc.*, due to the technical development, may stand for either increasing or decreasing costs in mining; generally what is above ground represents the latter, and what is below ground

stands for decreasing costs, also, except where it is the consequence of deeper mining, excessive water, and the like.[1]

Another very important factor in the estimate of cost is the difficulty or ease of mining, depending on the thickness, frequency and inclination of the seams, the character of the roof and floor, *etc.*, that is, the degree of richness of the mine. The differential returns in coal mining are of a surprising degree of variation. Taken in connection with depth, this is the critical factor of productivity and cost. For example, in the Ruhr district, of two mines, Dorstfeld and Ewald, not greatly unequal in size, the average output per capita per shift in the period 1893–99 (inclusive)—a period of steady production—was for the former .743 tons and for the latter 1.134 tons (a difference of over 52% compared with the former). As these average figures are approximate to the annual figures, the presumption is strong that they represent normal differences in productivity due to differences in the richness of deposits,

[1] Oldenburg, writing in 1890, explains the fall in price as due to decreasing costs following technical improvements (p. 286), and Kleine, writing in 1894, explains the increase in the per capita output of miners on the same ground (Kleine, *Ztg. Oberschl. B.-u. H. Ver.*, 1894, p. 10). The figures are striking; the per capita output for the Ruhr was:

1850	139 tons.
1860	154 "
1870	225 "
1880	280 "
1890	315 "

etc.[1] The differences between the productivity in particular mines in the same region is not generally greater than the differences between the natural productivity of different mining regions.[2]

PRODUCTION IN TONS PER CAPITA PER SHIFT.

Year.	*Ruhr.*	*Upper Silesia.*	*Saar.*
1890	.935	1.233	.767
1891	.906	1.178	.756
1892	.895	1.110	.744
1893	.900	1.183	.780
1894	.900	1.216	.772
1895	.898	1.255	.792
1896	.908	1.284	.808
1897	.897	1.310	.819
1898	.873	1.357	.819
1899	.865	1.356	.805
1900	.851	1.293	.795
1901	.821	1.165	.759
1902	.828	1.118	.766

The superiority of the Upper Silesian district over the Ruhr in respect to the richness and accessibility of deposits is striking, and still more so its advantage over the Saar. These we shall see below correspond to differences in general average cost. In the Ruhr we

[1] To show these facts more in detail the following table has been compiled comprising all the larger mines for which these data are presented in the *Dortmunder Jahrbuch*:

	1893.	*1894.*	*1895.*	*1896.*	*1897.*	*1898.*	*1899.*	*Av.*	Output in 1000 tons. 1893—1899
Dannenbaum	0.890	0.828	0.819	0.834	0.810	0.748	0.759	0.812	308— 345
Consolidation	----	1.057	1.099	1.096	1.089	1.082	1.080	1.084	1050—1433
Dorstfeld	0.710	0.770	0.690	0.754	0.769	0.765	0.741	0.743	316— 434
Ewald	1.141	1.045	1.043	1.200	1.172	1.199	1.141	1.134	387— 722
Graf Bismarck	1.040	1.130	1.160	1.140	1.080	1.010	1.020	1.083	694—1085
Harpener	0.908	0.858	0.872	0.930	0.896	0.887	0.872	0.889	2930—4976
Magdeburg	0.965	0.985	1.049	1.050	1.004	1.024	1.060	1.019	423— 510
Massen	0.860	0.888	0.914	0.877	0.819	0.829	0.866	0.865	249— 534
Mt. Cenis	----	0.842	0.829	0.831	0.891	0.950	0.976	0.887	208— 571
Pluto	0.845	0.801	0.826	0.808	0.894	0.806	0.811	0.827	623— 898
Average	0.919	0.920	0.931	0.952	0.942	0.930	0.933	0.933	

[2] *B.-H. u. S.*, 1903, p. 43.

seem to have distinct evidence of decreasing returns, due to the increasing difficulties of mining. Possibly Upper Silesia has reached that point also. The mines of the Saar, which have been worked at considerable depth for a much longer period, show a much greater constancy in returns.

Another very important element of cost is wages. Wages seem to have borne a fairly constant proportion to the total cost, the declining importance of labor power being offset by the increase in the rate of wages. According to Effertz's calculations, which cover a considerable majority of the production of the Ruhr district, the proportion of wages to the total cost was[1] in

1878	55.628%
1885	59.129%
1894	57.433%

Wages have advanced decidedly in the last fifteen years in all the mining districts, although the rate varies considerably between districts, and corresponds in some measure to differences in cost.[2]

AVERAGE WAGES PER SHIFT IN MARKS PER TON.

	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901
Upper Silesia	1.85	2.03	2.37	2.46	2.43	2.42	2.45	2.46	2.49	2.58	2.73	2.87	3.12	3.10
Lower Silesia	2.04	2.23	2.45	2.50	2.46	2.42	2.40	2.43	2.49	2.59	2.67	2.80	3.00	2.92
Dortmund	2.69	3.05	3.49	3.54	3.28	3.14	3.16	3.18	3.29	3.57	3.74	3.96	4.18	4.07
Saar	2.92	3.24	3.79	3.89	3.69	3.37	3.24	3.27	3.28	3.34	3.40	3.46	3.56	3.54

One reason for the lower wages in Upper Silesia is the richness of the mines which require a less proportion of miners to the total number of persons employed.[3]

Materials, relatively to wages, are an unimportant element of cost, but still the prices of wood and iron

[1] Effertz (1895), p. 9.

[2] *B.-H. u. S.*, 1902, p. 1.

[3] *Statistik, Oberschl. B.-u. H.*, 1902, Vorwort.

make a considerable difference. The rise of the prices of these and other commodities used in mining have contributed to increase the costs of production in the later nineties.[1]

The variations in the rate of interest do not seem to have affected the mining industry unfavorably in the period we have under consideration. Loans secured by mortgage formerly were made at 4½%, as a rule, but, during the last decade, they have been converted to a large extent to a 4% basis.[2] In this connection we may observe also a few points in regard to the policy of the mining companies in writing off depreciation and the establishment of reserves. The coal industry (as all mining industries) must take account of the fact that the material mined is taken from the ground once for all, and at the end of the term of exploitation nothing remains to the owners but machinery of relatively little value and a hole in the ground. For the period from 1873 to 1890, Effertz gives a calculation which shows that the average annual amount entered for depreciation was only about 1.6% of the share capital, or 1.36% of the total invested capital. Effertz thinks that 3% would be a fair amount,[3] which is certainly an excessively moderate estimate. The recent amounts have been much higher.[4]

Finally, among the component elements of cost, we

[1] *Oppeln Hk.*, 1900, p. 17; Enquete, p. 482. According to the *Zeitung d. oberschl. B.-u. H. Vereins*, 1901, p. 377, the cost of wood amounts to 65 to 80 pfg. per ton; it is stated that the prices of wood have risen 10–15%. This would give an increase of cost per ton for coal of a mean of 9 pfg.

[2] *Cf. Dortmunder Jahrbuch*, 1901, *passim.*

[3] Effertz (1891), pp. 11–12.

[4] *Cf.* Pt. IV., ch. vii.

may consider what are called in Germany "social burdens," which include not only taxation in the ordinary sense, but also compulsory contributions for workingmen's insurance, *etc.* The relative importance of these burdens in 1892–3 in the Ruhr are given by Effertz as follows: mining tax, 23%; "Knappschaft" contribution, 24%; accident insurance, 16%; old-age and sickness insurance, 10%; taxes, 26%; various other contributions, 1%. The first item in this list, namely, the mining tax (which was 2% on profits) ceased to be collected after 1894. On the other hand the local taxes are not included in the list, and the insurance burdens increased in weight in the following years.[1] Taking, however, the contributions stated above, Effertz finds that they formed the following element in the cost of coal mining.[2]

	% total cost.	*Cost per ton.*
1878	4.700	0.232 m.
1885	4.952	0.238 "
1894	8.740	0.557 "

These expenses have increased in recent years, taking the total of such burdens. Thus the accounts of the Harpener, one of the greatest and most prosperous mining companies in Germany, show that expenditures for such purposes in 1900–1 were 3,600,014.01 m.; the total expenditure was 37,114,557.99 m., so that they formed about 10% of the total cost. The total production was 4,921,170 tons (1901) which makes these contributions

[1] Effertz (1895), pp. 6–8.

[2] *Id.* (1895), p. 9.

about 0.73 m. per ton.[1] In much the same category as the compulsory payments for taxes and labor insurance, from the point of view of the cost of production, are the voluntary contributions to the benevolent institutions (Wohlfahrtseinrichtungen). The expenditures of Krupp in this direction (partly for coal miners) are well known.[2]

The question of the cost of production is critical for the proper estimation of the price policy pursued by the cartells, as well as other producers, but the subject, unfortunately, is not so free from uncertainty as could be desired. The proper analysis of value in relation to cost nowhere requires more complete data than in an industry like coal mining where (1) the costs of different mines vary widely, and (2) the costs undergo considerable variations from year to year. It would be quite insufficient to get the cost of production of an average mine for a normal year. That might do fairly well for some manufacturing industries, but it would be completely inadequate for mining. The official Prussian

[1] The details are as follows :

Taxes :		
Mining tax to Herzog v. Arenberg		120,929.11 m.
State tax		121,500.00 "
Communal taxes :		
Income	250,577.62	
Trade	204,907.19	
Land and Buildings	36,234.63	
		491,719.44 "
Other contributions :		
Berggewerkschaftskasse		29,961.28 "
Accident Association		502,101.24 "
Handelskammer		4,267.99 "
Boiler Insurance Union		12,209.00 "
Gauging fees		699.32 "
Knappschaft and Labor Insurance		2,316,626.62 "
		3,600,014.01 "

Glückauf, 1901, p. 1024.

[2] *Cf. Essen Hk.*, 1901, II, p. 20.

statistics contain, however, material for the determination of average costs for the Ruhr. These are found in the *Zeitschrift für das Berg-Hütten und Salinenwesen.* The facts are peculiar; under the title "Wert pro Tonne," averages are given for the different mining districts which except in the case of the Ruhr stand for average proceeds per ton.[1]

In the case of the Ruhr, they are estimated costs per ton, though this is not generally understood.[2] In addition to this material, and such occasional estimates as may be found in the literature of the industry, the present writer has compiled a table from material concerning the Dortmund district. which has apparently hitherto escaped the attention of economical writers, or at least remained unused, and which affords the proper sort of basis for the calculation of costs and the criticism of prices. For other districts than the Ruhr the material is wholly unsatisfactory,

From the statistical data concerning a large number of individual mines in the Ruhr contained in the *Dortmunder Jahrbuch* (1901) the following table of costs of production has been compiled. All the mines for which costs are given, except two or three mines accidentally omitted, are included in the table, which may be considered as quite representative of the district, especially for 1889–1899.

[1] Compare the statistics given there with the *Statistik d. Oberschl. B.-u. H.*

[2] Brefeld, minister of trade and industry, quotes them as statistics of price (see debate on the *état*, *Glückauf*, Feb. 1, 1900, Beilage, p. 4), and so does Calwer (see Calwer, 1900, p. 93). A hint, however, of their true significance may be found in Enquete, p. 50. The writer verified his deductions by enquiries made to the superintendent of one of the Ruhr mines.

COST OF PRODUCTION PER TON IN MARKS.

Mine.	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Altendorf	--	--	--	--	--	--	--	--	--	3.73	4 59	6.75	7.67	6.77	7.63	7.80	9.95	12.23	8.96	9.68
Aplerbecker	--	--	--	--	--	--	--	--	--	5.31	6.14	7.07	7.02	7.15	7.00	7.05	7.00	7.25	7.14	8.05
Bickefeld	6.25	5.28	6.72	7.08	6 36	6.82	6.05	5.77	5.97	6.88	9.22	7.31	6.96	6.95	6.91	7.39	8.72	8.53	8.74	8.64
Blankenburg	3.75	3.90	3.63	4.20	3 67	3.62	3.82	4.06	4 09	4 84	5 96	6.23	5.02	4.68	4.86	4.88	5.33	6.68	7.08	6.65
Bommerbänker	--	--	--	--	--	--	--	--	--	5.42	6 40	6.51	5.75	5.95	5.94	5.96	6.70	7.03	8.05	8.48
Caroline	5 55	6 74	6.83	6.36	6.32	5.98	5.87	6.15	6.55	6.94	7.62	7.36	6.82	6.36	6.29	7.05	7.42	6.91	7.36	8.03
Concordia	4.99	5 05	4.55	4 98	--	-	-	4.77	4.69	5.58	6.89	7.02	6.81	6.51	6.18	6.27	5.50	5.82	6.31	6.68
Dahlbusch	--	--	--	--	--	--	--	--	--	--	--	5.54	5 86	5.70	5.67	5.83	5.85	6.14	6.42	6.97
Dalhauser	3.85	3.78	3.90	4.00	3.86	3.84	4 20	4.13	4.64	5.09	6.04	6.65	6.87	7.76	7.13	7.70	12.75	8.72	9 71	8 52
Dannenbaum	--	--	--	--	--	--	--	--	--	5.63	6.25	6.22	5.91	5.76	6.09	6.16	6.25	6.83	7 72	8.30
Deutschland	--	--	--	--	--	--	--	--	--	--	--	--	--	8.12	8.03	7.13	8.05	6.79	10.62	7.34
Dorstfeld	5.18	5.05	5.22	5 35	5.39	5.49	5.34	5.20	5.15	6.91	7.91	8.05	8.19	7.39	7.17	7.53	7.00	7.19	7.91	8.67
Dortmunder—																				
Louise Tiefbau	--	--	--	--	--	--	--	--	--	--	--	--	--	5.65	5.31	5.58	5.79	6.71	7.17	7.17
Bruchstrasse	--	--	--	--	--	--	--	--	--	--	--	--	--	7.28	8.31	7.63	7.93	8.10	8.44	8 63
Eiberg	--	--	--	--	--	--	--	--	--	5.05	5.52	6.68	6.49	6.11	5.89	6.07	6.34	6.69	6.67	6.97
Eintracht	--	--	--	--	--	--	--	--	--	6.07	7.08	7.33	7.17	7.06	6.91	6.21	6.04	7.07	7 19	7.68
Ewald	--	--	--	--	5.88	5.61	5 37	4.55	5.30	5.99	6.25	6.59	6.28	6.02	6.25	5.90	5.26	5.80	5.67	6.93
Frei Vogel u. Unverhofft	--	--	--	--	--	--	--	--	--	6 05	7.50	7.41	6.68	6 55	6.56	6.79	6.85	7.06	7.56	8.40
Friedlicher Nachbar	4.90	5.03	5.23	5.33	4.94	4.63	4.38	4.54	4.66	6 93	7.92	8.65	7.23	6.21	7.45	6 78	6.43	8.16	9.65	11.14
Friedrich d. Grosse	--	--	--	--	--	--	--	--	--	6.05	7.15	7.44	7.02	6 81	7.15	7.40	7.37	7.07	7.35	8.48
Gen. Blumenthal	--	--	--	--	--	--	--	--	--	--	7.82	8.20	7.61	6.94	6.87	6.35	6.69	7.19	6.93	7.26
Gelsenkirchen—																				
Rhein Elbe u. Alma	--	--	-	--	--	--	--	--	--	4.81	5.73	6.23	5.94	5.84	5.96	5.96	5.96	5.82	5.94	6.32
Stein	--	--	--	--	--	--	--	--	--	3.64	4.63	6.27	5.74	5.33	5.54	5.51	5.58	6.02	6.12	6.50
Hardenberg	--	--	--	--	--	--	--	--	--	5.73	6.37	6.27	5.74	5.33	5.54	5.51	5.58	6 02	6.12	6.50
Erin	--	--	--	--	--	--	--	--	--	4.36	5.95	6.20	5.94	5.38	5 25	5.12	5.17	5.21	5.52	5 68
Hansa	--	--	--	--	--	--	--	--	--	7.07	7.00	6.17	5.77	5.50	5.55	5.95	6.68	7.34	7.04	7.12
Zollern	--	-	--	--	--	--	--	-	--	4.78	6.44	6.49	5.81	5 70	5.83	5.71	5.48	6 41	7.76	8.02
Germania	--	--	--	--	--	--	--	--	--	4.78	5.67	5.91	5.89	5.48	5.37	5 20	5.25	5.91	6.37	6 79
Monopol	--	--	--	--	--	--	--	--	--	5.47	6 82	6.62	6.25	5.81	5.84	5.60	5.37	5.83	6.59	7.29
Bonifacius	--	--	--	--	--	--	--	--	--	5.10	6.02	6.34	6.44	6.83	6.45	6.05	5.91	6.97	7 41	8.20
Glückwinkelburg	--	--	--	--	--	--	--	--	--	--	--	6.75	6.50	6.00	6.15	6.26	6.28	5.62	5.22	5.92
Graf Bismarck	6.48	4.99	5.29	6.09	4.93	4.67	4.69	4.65	4.72	5.40	6.01	6.09	5.92	5 93	5.85	5.51	5.67	6.26	6.61	6.84
Graf Schwerin	--	--	--	--	--	--	--	--	--	6.33	7.29	7.09	6.64	6.63	6.65	6.64	6.86	7.54	7.34	7.65

Mine.	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Harpener (15 mines)	--	--	--	--	--	--	--	--	--	--	--	6.25	5.67	5.62	5.70	5.80	5.74	6.08	6.49	7.33
Heinrich	5.06	5.69	4.60	5.76	5.34	4.44	5.79	5.07	5.94	5.27	5.74	5.29	6.42	6.19	6.06	5.88	6.06	7.56	7.56	7.74
Johann Deimelsberg	--	--	--	--	--	--	--	--	--	6.08	11.24	6.99	6.10	6.40	5.97	6.09	6.31	7.03	7.09	8.28
Julius Philipp	4.51	4.22	4.60	5.32	4.84	4.53	4 38	3.87	4.44	5 61	6.96	7.36	6.79	6.97	6.79	6.68	6.87	6.83	7.38	8.55
Kölner Bgwerk	3 84	3.82	3.99	3.89	4.06	4.02	4.07	4.01	4.03	4 70	5.68	5.69	5 83	5.48	5.50	5.24	4.94	5.14	5.39	5.65
König Ludwig	--	--	--	--	--	--	--	--	5.85	6.38	6.66	7.42	6 92	6 42	6.39	6.42	6.45	6.74	7.29	8.12
Langenbrahm	--	--	--	4.25	4.68	4.71	5.27	4.52	4.88	5.21	5.99	6.49	6.96	6.79	7.35	7.38	7.07	6.95	7.32	7.80
General	--	--	--	--	--	--	--	--	--	6.23	7.45	7.85	7.08	7.15	7.13	7.45	--	9.76	9.76	10.34
Magdeburg	--	--	--	--	--	--	--	--	--	5.34	6.62	6.65	6.88	6.29	6.30	5.77	5.60	5.92	6.17	6.34
Mark	--	--	--	--	--	--	4 46	4.52	5.21	6.28	7.74	7 74	6.46	6.10	5.89	5.96	6.17	6.37	6.84	7.84
Massen	--	--	--	--	--	--	4.55	4.39	4.46	5.32	7.27	6.84	6 72	6.31	6.42	6.73	7.00	7.57	7.47	7 73
Mt. Cenis	--	--	--	--	--	--	--	--	--	6.38	6.88	7.42	7.69	6.58	6.20	6.41	6.67	6.64	6 44	6.64
Mühlheimer—																				
Humboldt	--	--	--	--	--	--	--	--	--	--	--	6.94	6.74	6 48	5.98	5.26	5.37	5.84	6.21	7.69
Wiesche	--	--	--	--	--	--	-	--	--	6.66	7.72	10.17	7.46	7.23	6.17	7.66	9.38	18.86	8.00	7.81
Nordstern—																				
Nordstern	--	--	--	--	--	--	--	--	--	5.51	6.73	8.30	8 49	7.44	6.34	5 94	5.56	5.95	5.88	6.05
Graf Moltke	--	--	--	--	--	--	--	--	--	5.59	--	--	8.15	6.82	6.52	6.82	6.18	6.70	6.85	6.50
Paul	--	--	--	--	--	--	--	--	--	4.59	5.88	7.59	6.56	5.95	5.84	5.90	6.56	6.34	7.11	7.36
Preussische Clus	--	--	--	--	--	--	--	--	--	12.72	10.49	10.62	10 81	10.24	10 50	10.48	10.69	11.33	11.55	11.48
Prinz Friedrich	--	--	--	--	--	--	--	3.07	3.07	5.11	7.07	4,62	5.48	5.02	4.96	5.14	5.00	4.25	4.83	4.34
Rheinische Anthracit	--	--	--	--	--	--	--	--	--	5.35	5.43	5.22	5.03	4.94	4.99	4.92	4.65	5.01	5.97	5.96
Centrum	3.83	3.68	4.31	4 95	4.14	3.78	3.56	3.85	4.24	5.09	6.40	5.95	5.63	5.61	5.67	6.05	6.45	6.23	6.77	7.43
Richradt	--	4.79	4.34	3.59	3.71	3.33	3.48	3 10	6.28	4.74	4.84	4.91	4.86	4 46	4.92	4.50	4.23	4.53	4.52	5 05
Pluto	4 63	4.79	4.99	5.00	4.75	5.00	4.81	4.28	4.86	6.12	6.98	6.84	7.14	6.59	6.58	6.99	7.14	7 22	7.12	8.18
Schürbank u. Char.	5.52	5.06	4.78	4.34	4.15	4.55	4.91	4.28	4.62	5.50	6.70	6.81	6.77	6.50	6.80	6.47	6.55	6.52	7.25	7.67
Steingatt	--	--	--	--	--	--	--	--	--	4.33	4 70	5.07	7.02	8.13	7.83	8.32	8.70	9.16	9 01	10.30
Stock u. Scherenberg	--	--	--	--	--	--	--	--	--	9.58	9.24	6.73	7.07	9.36	8.05	8.83	6.99	6.60	7.02	8.58
Trappe	--	--	6.31	5.99	6 00	5.28	4.19	4.56	5.00	6.22	6.56	6.21	5.96	6.30	6.98	6 09	6.02	6.02	6.32	6.93
Tremonia	--	--	--	--	--	--	4.57	4.54	5.35	6.83	9.62	7.37	6.90	6.51	6.41	6.78	6.73	6 98	7.31	7.92
Unser Fritz	--	--	--	--	--	--	--	--	--	5.17	5.79	5.87	6.28	5.89	5.82	5.96	5.96	6.34	6 71	6.94
Wiendahlsbank	--	--	--	--	--	--	--	--	--	--	--	--	--	5.81	5.87	6.46	6.91	7.83	8 25	8.60
Average	4.84	4.79	4.95	5.03	4.88	4.72	4.69	4.45	4.96	5.78	6.79	6.80	6.61	6.39	6.37	6.38	6.63	7.04	7.18	7.58

The preceding table includes mines having about 50% of the total output of the Dortmund district, and gives a fairly reliable showing of the cost of production. A comparison of the averages with the returns from the *Zeitschrift f. d. Berg-Hütten u. Salinenwesen* show conclusively that the latter are figures of cost. To these we add various occasional estimates, of which those of Effertz, based on elaborate calculations, are specially valuable.

AVERAGE COST PER TON IN THE DORTMUND DISTRICT.

YEAR.	Table, pp. 154–5	B.-H. u. S.	Misc.	YEAR.	Table, pp. 154–5	B.-H. u. S.	Misc.
1878	....	4.60	4.94[1]	1891	6.80	8.38	.....
1879	....	4.20	.....	1892	6.61	7.38	7.25[3]
1880	4.84	4.58	.....	1893	6.39	6.42	.....
1881	4.79	4.58	.....	1894	6.37	6.38	6.38[1]
1882	4.95	4.60	.....	1895	6.38	6.66	.....
1883	5.03	4.76	.....	1896	6.63	6.77	.....
1884	4.88	4.76	.....	1897	7.04	7.04	.....
1885	4.72	4.70	4.81[1]	1898	7.18	7.32	.....
1886	4.69	4.69	.....	1899	7.58	7.66	.....
1887	4.45	4.64	.....	1900	....	8.54	.....
1888	4.96	4.80	.....	1901	....	8.77	8.20[4]
1889	5.78	5.47	.....	1902	....	8.39	.....
1890	6.79	7.98	6.50[2]	.....	....	....	.....

The average cost of production furnishes only an approximate measure for the criticism of price policy, because in a commodity like coal, produced under conditions of differential costs, an adequate price must be reckoned, not from the basis of average cost, but from the basis of the cost of that part of the necessary supply produced at the greatest disadvantage. In the case of coal produced under a cartell *régime*, such as that of the

[1] Effertz (1895), p. 8–9. For 1878 he reckons on a basis of 59.60% of the output; for 1885, on 65.96%, and for 1894, on 79.63%.

[2] Kanitz, p. 9.

[3] Kleine, *Zeitung Oberschl. B.-u. H.*, 1894, p. 11.

[4] Grassmann, *Stahl u. Eisen*, 1902, p. 846.

Ruhr, some modifications appear necessary to this general statement; that is to say, in so far as the cartell has kept concerns going, which under competition would be driven out of the business, and whose portion of the supply could be furnished by the richer mines at less expense, it does not seem proper to take their costs as the margin of the cost of production. In other words the proper margin of cost of production is not to be found in the unusually expensive ones. It must be remembered, also, that even very good mines may show from time to time abnormally high costs of production, due to accidents, labor troubles, cessation of mining to do development work, *etc.* Here, also, the true margin of cost is not to be found in the cases of abnormally expensive production. Just where to draw the line is a very difficult question, but some exercise of reasonable judgment gives a better standard than would be otherwise obtained. At any rate some idea may be formed of the margin of cost. For this purpose the production of the mines given on pp. 154–5, for the years 1894 and 1899, may be tabulated according to cost of production, as follows:[1]

Cost. *m.*	1894		1899	
	Production Tons	Per ct.	Production Tons	Per ct.
Under 5.00	270,127	1.3	----------	----
5.00–5.50	11,227,183	6.2	760,885	2.8
5.50–6.00	10,218,046	51.6	1,616,755	6.1
6.00–6.50	3,786,573	19.2	2,318,485	8.7
6.50–7.00	2,635,499	13.3	6,199,168	23.4
7.00–7.50	1,202,160	6.0	7,492,031	28.2
7.50–8.00	290,417	1.5	2,685,945	10.1
8.00–8.50	139,728	0.7	3,588,404	13.5
8.50–9.00	----------	----	1,477,807	5.6
Over 9.00	----------	----	417,680	1.6
	19,769,733		26,557,160	

[1] Production compiled from statistics of individual mines in *B.-H. u. S.*, 1894 and 1899.

According to the data given in the above table, 0.7% of the tonnage was produced in 1894 at a cost of from 8.00 to 8.50 m. per ton. It would, evidently, be absurd to take 8.50 m. as the margin of cost, but how much to cut off is largely a matter of opinion or guess work. Let us assume 15% as a fair estimate. Calculating as near to this as possible from the detailed statistics of production for these mines, we find that a deduction of 14.7% of the output would give for the remainder a margin of cost of 6.65 m. If to this we add 0.60 m. for pure interest (4% on an assumed capital of 15 m. per ton),[1] we have 7.25 m. as a theoretical margin of cost. Calculating the margin for 1899 in the same way, we find that by the exclusion of 13.2% of the total production (the nearest obtainable to 15%) we get a maximum cost at 8.18 m., and, adding an interest charge of 0.60 m., we have a total marginal cost of 8.78 m. If these calculations should be taken as approximately correct, we would have standards for *fair prices* for 1894 and 1899 respectively at 7.25 m. and 8.78 m.[2] These calculations, however, rest on too many suppositions to make it worth while to carry them out in detail for each year. So that in general we shall have to be satisfied with the theoretically much more imperfect standard of average cost.[3]

No adequate statistical material is available for estimating the cost of production in Upper Silesia. Sympher makes an estimate in 1899 that the cost of pro-

[1] See Pt. IV., ch. vii.

[2] The proceeds per ton of the syndicate for those two years is reported at 7.83 m. and 9.14 m. respectively. Enquete, p. 279.

[3] An analysis of the data presented by Effertz in his *bróchures* for 1894 and 1895 (taken together) according to the theory worked out above, gives remarkably close results for 1894. It seems that if 10% of the total production embraced in his calculations is excluded (in order to reach the marginal cost), we would arrive at 7.61 m. as a result.

duction is about 5.30 marks.[1] There is probably less variation on the whole than in the Ruhr, as the region is very rich and not much developed. That the cost of production has been low is shown by the figures for the fiscal mines.[2]

	König. m.	*Königin Luise.* m.	*Average.* m.
1888–89	3.087	3.340	3.214
1889–90	3.522	3.799	3.661
1890–91	4.473	5.103	4.788
1891–92	4.740	5.564	5.520
1892–93	4.911	5.300	5.106
1893–94	4.484	4.672	4.578

In recent years the costs have considerably increased, due, according to Williger, to greater depth and more water.[3] Voltz gives some particulars which throw a little light on the situation. It seems that the costs in the fiscal mines increased by 1.60 between 1895 and 1903, and that in the case of two private concerns the costs increased 1.89 and 1.96 m. respectively. Voltz places the present cost in the fiscal mines at nearly 6.00 m.[4]

The cost of production in the Saar has been higher generally than either in Upper Silesia or the Ruhr, though there is surprisingly little increase in the last few years, compared with the other regions. According to Laur, the cost per ton in the period 1883–1901 was as follows:[5]

	m.		m.
1883–84	5.73	1892–93	8.03
1884–85	5.75	1893–94	7.29
1885–86	5.58	1894–95	7.13
1886–87	5.61	1895–96	6.94
1887–88	5.43	1896–97	6.85
1888–89	5.46	1897–98	6.87
1889–90	6.70	1898–99	7.14
1890–91	7.98	1899–1900	7.51
1891–92	8.39	1900–01	7.51

[1] Sympher, p. 132.

[2] Renauld, p. 53.

[3] Enquete, p. 482.

[4] *Id*, pp. 493–4, (1902).

[5] Laur, II, p. 130.

CHAPTER III

PRODUCTION AND COST OF PRODUCTION OF COKE

The production of metallurgical coke in the various regions of the German Empire from 1891 to 1902 is shown in the following table.[1]

DISTRICT.	PRODUCTION OF COKE (1000 TONS.)											
	1891	*1892*	*1893*	*1894*	*1895*	*1896*	*1897*	*1898*	*1899*	*1900*	*1901*	*1902*
Ruhr District	4388	4561	4780	5399	5563	6265	6872	7374	8202	9644	8778	8969
Upper Silesia	1118	1060	1060	1121	1114	1269	1399	1348	1399	1411	1257	1172
Lower Silesia	293	325	366	416	427	443	424	430	460	536	514	470
Saar District	584	587	574	695	713	744	821	887	923	894	838	928
Aachen District	266	259	219	207	287	310	337	338	353	367	360	372
Obernkirchen	25	26	27	24	27	27	30	30	31	31	31	43
Kingdom Saxony	82	82	73	79	70	77	77	72	74	74	63	58
German Empire	6712	6899	7099	7941	8201	9135	9960	10479	11442	12957	11841	12012

It is evident, from an inspection of the above table, that most of the coke is produced in the Ruhr; in 1902 it comprised 74.66% of the total for the Empire. The development of coke production on a large scale is comparatively recent; the production of the Ruhr in 1850 was only 73,112 t., and in 1870 only 341,033[2] tons.

Of the Ruhr production, 76.6% is in the hands of the coke syndicate which produces nearly three fifths (57.2%) of the whole output of the Empire. In the second largest field,—Upper Silesia—coke was only very recently cartelled;[3] there is no cartell in Lower Silesia.[4] In the Saar the production is mainly in private hands.[5] The only other noteworthy district

[1] *Dortmunder Jahrb.*, 1901, p. 581, (for 1891–3); *Jahresbericht des Vereins*, Dortmund, 1902, p. 9, (for 1894–1902) The statistics of production given here are for coke plants at the mines, and do not include gas-coke. See *Stahl u. Eisen*, 1898, p. 641.

[2] Bericht d. Cokssyndicat, 1900, Anhang.

[3] *Kartell-Rundschau*, July 12, 1903, p. 149.

[4] *Industrie Ztg.*, 1902, p. 182.

[5] For 1901 the chief Saar producers, besides the fiscus, were Enkel de Wendel, 110,000 tons; Gebruder Stumm, 163,866 tons; Luxemburg Bgw., 194,236 tons; Röchling'sche Eisen u. Stahlw., 192,296 tons; this gives a total of 660,398 tons. *Saarbrücken Hk.*, 1901, II, p. 3.

is Aachen, and its production is cartelled with that of the Ruhr.[1] The production of the coke syndicate and its relative importance in the Ruhr district and Empire are shown in the following table.[2]

Year,	*Production Coke Synd. Tons.*	*Per ct. of Ruhr.*	*Per ct. of Emp.*	*Year.*	*Production Coke Synd. Tons.*	*Per ct. of Ruhr.*	*Pr. ct. of Emp.*
1891	3,937,733	89.7	58.7	1897	6,036,530	87.8	61.1
1892	4,025,053	88.3	58.3	1898	6,415,683	86.9	61.1
1893	4,196,917	87.8	59.1	1899	7,045,923	85.9	61.5
1894	4,736,195	87.7	59,6	1900	7,786,826	80.7	60.1
1895	5,040,092	86.7	58.7	1901	6,833,567	77.8	57.7
1896	5,574,695	88.9	61.0	1902	6,873,162	76.6	57.2

The significance and power of the coke syndicate is measured more nearly by its relation to the production of the Ruhr district, than to the whole Empire. Over the industrial markets of the west, it holds undisputed sway. An examination of its proportion of the Ruhr output shows a very marked decline between 1891 and 1902, namely, 13.1%, but, as in the case of the coal syndicate, the real meaning of this change is understood only when we consider the outsiders who produce this tonnage. Strictly speaking, there are three groups of producers in the Ruhr besides the syndicate; first, those works that are allied to the syndicate and whose production is included in the above table;[3] second, the outsiders proper, and third, the coke works independently operated by blast furnaces and other consumers. Their relative importance is shown in the following table:[4]

[1] *Cf.* Rept. of coke syndicate, in *Bochum Hk.*, 1894, p. 11.

[2] *Dortmunder Jahrbuch*, 1901, p. 554; Bericht d. Cokssyndicat. Certain private works allied to the syndicate are included in these figures.

[3] Five works, apparently, producing about 328,000 tons. Steinkohlenzechen, p. 103.

[4] *Dortmunder Jahrbuch*, 1901, p. 554. Reports of coke syndicate.

Yr.	Syndicate.		Outsiders.	Blast Furnaces.		Total Output, tons
	Output, tons	Per ct.	Output, tons	Output, tons	Per ct.	
1891	3,937,773	89.7	62,160	388,077	8.8	4,388,010
1892	4,025,053	88.3	142,350	393,581	8.6	4,560,984
1893	4,196,917	87.8	141,574	441,998	8.2	4,780,489
1894	4,736,195	87.7	119,052	543,365	10.1	5,398,612
1895	5,040,092	88.8	82,233	540,178	9.7	5,562,503
1896	5,574,695	88.9	158,680	531,963	8.5	6,265,338
1897	6,036,530	87.8	191,693	653,777	9.5	6,872,000
1898	6,415,683	86.9	163,154	795,483	10.8	7,374,320
1899	7,045,923	85 9	218,332	937,367	11.4	8,201,622
1900	7,786,347	80.7	392,300	1,465,510	15.2	9,644,157
1901	6,833,567	77.8	488,455	1,456,185	16.6	8,778,207
1902	6,873,162	76.6	330,830	1,765,461	19.7	8,969,453

From this table it appears, that the syndicate has lost ground considerably in the general production, but, as it has lost it to the blast-furnace works, which consume most of the coke they make, it does not have such an important influence on the market as it otherwise would.[1]

Another fact that tends to strengthen the syndicate is that with a number of the so-called Hüttenzechen arrangements have been made whereby they place the sale of their surplus product in the hands of the cartell.[2] The syndicate sells, therefore, more coke than it produces. In 1895 it sold in all 5,514,830 tons, of which 141,640 tons were for the Aachen district, 40,416 tons for allied coke works, 5,122 tons for blast furnaces, and 505,860 tons for the Belgian syndicate.[3]

For its policy in regulating the output, the coke syndicate has come in for much more blame than the coal syndicate. An inspection of the table of production shows that there was a great increase in the output,

[1] Some of the blast-furnace works own cokeries which belong to the syndicate, viz., Carolinenglück (Bochumer Verein), Dannenbaum (Deutsche-Luxemburgische A. G,), Pluto (Schalker), and Westphalia (Hoesch). Steinkohlenzechen, pp. 102–4.

[2] Steinkohlenzechen, p. 104.

[3] Report of coke syndicate for 1895, in *Bochum Hk.*, 1895, p. 9.

during the first decade of its existence, from 3,937,773 tons in 1891, to 7,786,347 tons in 1900, an increase of 97.7%. This covered the period of *hochconjunctur*. In the two following years (1901–1902) there was a distinct decline, coinciding with the crisis. All this was according to the approved methods and principles of cartell management, and the question is whether there was enough coke to supply the demand in both periods. The demand for coke is almost entirely industrial. Thus in 1902, about ten elevenths of the coke produced was large coke (gross coks), which is used for blast furnaces (79.78%) and foundries.[1] A less recent, but more instructive statement of coke consumption is found in the following table for the coke syndicate for 1890:[2]

	Consumption.		*% Gross Coks.*
Blast furnace	2,773,560	tons.	76.47
Steel mills	64,660	"	1.78
Foundries, smelters	611,074	"	16.85
Railways	35,600	"	0.98
Sugar factories	16,900	"	0.47
Cement factories	18,750	"	0.52
Export (over sea & Italian)	106,250	"	2.93
Large coke	3,626,794	"	100.00
Broken coke	131,506	"	
Small coke	87,590	"	
	219,096	"	

Leaving out export, the first three uses constitute about 95% of the whole consumption; that is, coke consumption is practically measured by the demand of the iron industry. In order, therefore, to measure the relation of the supply and demand for coke we must compare the inland consumption and iron production.

This is shown for the Zollverein in the following table:

[1] Calculated from Berichte d. Cokssyndicat, 1900–1902.

[2] *J.-B. Dortmunder Verein*, 1890, p. 23.

Year.	Coke** production 1000 tons.	Coke* imports 1000 tons.	Coke* exports 1000 tons.	Domestic consumpt'n of coke 1000 tons.	Iron§ production 1000 tons.	Ratio of coke consumption to iron production.
1891	6712	319	1354	5677	4641	1.22
1892	6899	466	1718	5643	4937	1.13
1893	7099	439	1902	5636	4986	1.13
1894	7941	404	2262	6083	5380	1.13
1895	8201	462	2293	6370	5465	1.17
1896	9135	394	2216	7313	6373	1.15
1897	9960	435	2162	8233	6881	1.19
1898	10479	333	2133	8679	7313	1.19
1899	11442	463	2138	9767	8142	1.19
1900	12957	513	2229	11233	8423	1.33
1901	11841	401‡	2097‡	10145	7785	1.30
1902	12012	362‡	2181‡	10193	8402†	1.21

**Dortmunder Jahrbuch*, 1901, p. 581 ; §*Stahl. u. Eisen*, 1902, p. 341 ; ***Dortmunder Jahrbuch*, 1901, p. 581, *J.-B. d. Vereins*, Dortmund, 1902, p. 9 ; † Bericht d. Cokssyndicat, 1902 ; ‡ Auswärtige Handel d. D. Zollgebiets, 1902, II.

The column of ratios shows an almost steadily increasing supply of coke as compared with the demand in iron production for the *hausse* period, and the decline in 1902 marks rather a return to conditions of normal supply, as compared with the excessive purchases at the time of the two year fusion contract.

In accommodating the supply to the demand, two problems are presented : first, measurement of the production, secondly, measurement of the consumption. The difficulties which confront the coal producers in determining their capacity and in producing according to their plans necessarily confront the coke producers also in getting their supplies of coking-coal. On the other hand, in the process of coke manufacture itself, the calculations as to production are relatively simple and certain.[1] The only complication worth noticing in this connection is that arising from the use of various kinds of ovens. There are two chief sorts, *i. e.* the by-product ovens and the ordinary or "normal" ovens.

[1] *Cf.* Report of coke syndicate, in *Bochum Hk.*, 1898, p. 49.

Of the former, six grades may be distinguished with capacities ranging from 900 to 1400 tons, and of the latter, five grades varying from 700 to 1000 tons.[1]

If regularity of production is important for the economical production of coal, it is still more so for coke, because an irregular employment involves great expense, through the cooling of the ovens, and, in the case of by-product ovens, the work must necessarily be prosecuted day and night in a continuous action in order to get the proper mixture of gases, *etc.*[2]

Any judgment of the success of the coke producers in controlling the output must take account of the needs of the producers as well as the needs of the consumers. With these difficulties to contend with, it is not surprising that the accommodation of supply to demand is not always perfect. Thus, in 1898–99, the coke producers found themselves unable to meet all demands,[3] while the sudden change of *conjunctur* in 1900 made coke a drug in the market in the following year, and blast-furnaces producing coke for their own use made the confusion worse by trying to sell unused quantities.[4] Where the coke had been contracted for in advance, the consumers who no longer needed it were given some relief by postponements of delivery, which added to the uncertainty of the problem, presumably, for the producers.[5] It was the desire of the coke producers to get a steady basis for production, as well as the wish to make sure of the favorable prices prevailing

[1] Enquete, p. 618.

[2] *Id.*, pp. 635, 747.

[3] *Id.*, p. 638; *Oppeln Hk.*, 1898, p. 6.

[4] Supra, 1901, p. 7.

[5] Enquete, pp. 661, 682.

during the *hochconjunctur*, that led to the formation of the widely condemned two year contracts.

The method adopted by the coke syndicate for the regulation of the output is similar to that of the coal syndicate. There is an estimate of the maximum technical capacity of the ovens, which is made the basis for the participation figures, and these are increased with the development of the plants, provided the situation of the market permits it. No coke plant may claim an allowance beyond what it can actually produce.[1] The allowances for production are controlled, further, by a calculated contraction which is intended to make the supply equal to the demand. The ordinary ovens are better adapted to such changes than the by-product ovens, and it is said that this is one reason for their continued use in large numbers.[2]

The production has generally been below the participation figures, being subjected as a rule to a contraction by the cartell. In some periods, however, when the demand exceeded the theoretical technical capacity, it was found impossible to equal the participation figures, although all restrictions on production were removed. Sometime this was due wholly or partly to external causes, as in 1898, when there was a scarcity of coking-coal.[3] In 1899, fires and other disturbances of production kept some ovens behind, so that, in spite of the fact that other ovens were producing in excess of their quotas, the total production was 1.8% behind the

[1] Enquete, p. 617.

[2] *Cf. Id.*, p. 747. Of the 8907 ovens in operation in 1902, about one-third (2803) were equipped for by-products. Bericht d. Cokssyndicat, 1902.

[3] Report of coke syndicate, in *Bochum Hk.*, 1898.

participation figures.[1] On the other hand, for the month of October 1894, the production exceeded the participation 1.75%.[2] Complete data as to the projected and actual contraction are lacking, but the following table shows the general policy and practice of the syndicate.[3]

Year.	Projected contraction.	Ac ual contraction.	Yr.	Projected contraction.	Actual contraction.
1891	8% (last 5 mo.)	----	1897	----	----
1892	18.75	13	1898	----	7.65 first half.
1893	23.5	14.6	1899	0	1.8
1894	6.7	5	1900	0	0
1895	----	Jan. Nov. Dec. 0 rest of year, 4–19	1901	23.16	21.35
1896	----	6.17	1902	31.8	23.93

For the participation figures fuller though not complete data are available.[4]

Year.	Participation Figures.	Year.	Participation Figures.
1891	3,863,672[5] tons.	1897	[6]5,733,990 tons.
1892	4,626,500 "	1898	Jan. 1, 6,238,682 "
1893	4,914,400 "	1899	" 6,924,936 "
1894	4,985,500 "	1900	" 7,094,434 "
1895	------	1901	" 8,030,044 "
1896	5,941,300 "		Dec. 31, 8,578,144 "
		1902	" 8,647,194 "

The increase shown here between 1891 and 1902 amounts to over 124%. According to the contraction figures, as presented above, the consumers do not seem to have had much ground for complaint on the score that the plants were restricted in their output. The wild

[1] Bericht d. Cokssyndicat, 1899.

[2] Report of coke syndicate, in *Bochum Hk.*, 1894, p. 11.

[3] 1891–8, *Id.*, 1898–1902, Berichte d. Cokssyndicat; 1897, *Ztg. d. Oberschl. B.-u. H.*, 1897, p. 302.

[4] Reports of coke syndicate, and calculations therefrom.

[5] Enquete, p. 619; [6] *Ztg. Oberschl. B.-u. H.*, 1897, p. 202.

demand for coke came in 1899 and 1900, and at that time there was practically no limitation, while in 1901–2, when a heavy contraction was imposed, many concerns were complaining of being obliged to take the amounts they had contracted for, and were very glad when the syndicate would consent to postpone delivery. But it may well be asked whether the syndicate did not prevent the establishment of new plants to such a degree as to make the coke famine in 1899–1900 a possibility. If the syndicate failed in this respect, it would seem to be an error that could be neither forseen nor proved afterwards to have been committed. If we compare the production of blast furnace coke of the coke syndicate sold in the domestic market with the iron production of the Zollverein, the coke supply available for inland consumption shows a marked relative increase up to 1901, though it falls off in the last two years[1]

There are very great differences in the amount of coke produced by different concerns, but this fact has not the same significance as for coal production. They are grouped as follows:[2]

Over 1,000,000 tons	2	concerns.
300,000–500,000	5	"
200,000–300,000	5	"
100,000–200,000	14	"
50,000–100,000	13	"
Under 50,000	5	"
Total production = 8,647,194	44	concerns.

With a few unimportant exceptions, (outside of the syndicate) the coke works are attached to the coal mines, and large coal mines, such as Harpener or Gelsenkirchen, naturally have a large coke production.

[1] Enquete, p. 620, and Bericht d. Cokssyndicat, 1900, Appendix.

[2] Enquete, p. 791.

Of course to make coke at all the mine must produce the right sort of coal. There does not seem to be any great advantage in developing production on a large scale from the technical standpoint, and it is a fact that the large concerns operate their coke works at the various locations of their mines. Thus there are forty-four members in the syndicate, but there are ninety-nine distinct plants.[1] The utility of the syndicate, from the point of view of economy of production, lies apparently in the administration of sale and the saving of freight charges. It is noteworthy that only the first was urged on the coke producers in Bergassessor Pieper's memoir in 1887, and that principally from the expected advantages in price-making.[2]

The purchase of coal mines, and the coke works belonging to them, by blast furnaces has for its main object the acquisition of a supply of coke. This proceeding has been made more desirable since the coal and coke syndicates began to put up prices, but they have only accelerated a movement which began long before.[3]

In respect to the quality of the coke under the syndicate *régime*, many complaints have been made,[4] chiefly in the years of extraordinary demand when the natural tendency would be towards some deterioration in quality.[5] The production of a good coke depends, first of all, on having the right sort of coal; obviously when the demand is very great, inferior sorts may be used, as better than none, while the fact that the syndicate re-

[1] Enquete, p. 718.

[2] Denkschrift über den Alleinverkauf von Koks, *etc.*, 1887, reprinted in Enquete, p. 773, Anlage 4.

[3] *Id.*, p. 753.

[4] *Id.*, pp. 710 *et seq.*; Wieser, p. 316.

[5] Enquete, pp. 717, 720.

fuses to guarantee quality opens the door to considerable abuses.[1] A quantitative measurement of the degree of deterioration was presented by Generaldirektor Bertram-Brückhöfe at the Enquete. According to exact analyses, Bertram found that the coke supplied at his works (about 300–400 tons daily) contained the following percentages of ashes and water.[2]

Year.	*Analyses.*	*Year.*	*Analyses.*
1886	14.90	1898	19.10
1887	12.81	1899	18.96
1888	15.64	1900	21.43
1889	15.49	1901	18.94
1890	21.46	1902	17.00
Average	16.06	Average	19.09

The effect of this additional degree of impurity during the second period as compared with the first (excluding the exceptional years 1890 and 1900) Bertram calculates at 2.29 m. per ton on a price basis of 19 m. per ton.[3] The editors of *Stahl und Eisen* summed up the situation as follows:—"individual exceptions only verify the general picture that for the consumer the character of the Westphalian coke shows a most sensible deterioration."[4]

[1] Especially noteworthy is the arraignment of the coke syndicate by Kirdorf-Rote Erde (brother of the coal magnate), chairman of the Halbzeug-Verband. *Cf.* Enquete, pp. 725–8.

[2] *Id.*, p. 715.

[3] *Id.*, pp. 715–16. Another series of analyses of Ruhr coke, covering the period 1893–1900, shows the same result.

Year.	*Ashes.*	*Water.*	*Total.*
1893	8.76	4.76	13.52
1894	8.99	5.98	14.97
1895	9.45	5.99	15.44
1896	9.91	6.60	16.51
1897	9.95	8.32	18.27
1898	10.00	8.77	18.77
1899	10.05	8.62	18.67
1900	10.00	10.10	20.10

See *Stahl u. Eisen*, 1901, p. 291; see also p. 213.

[4] *Id.*, 1901, p. 293.

The cost of production of coke presents quite a different problem from the cost of coal. In the first place, the cost of coke depends chiefly on the cost of coal, and must rise and fall, generally speaking, in proportion with it. Leaving the cost of coal out of account, the manufacture of coke seems to be an industry of something like constant returns. But the addition of the manufacture of by-products greatly complicates the problem of the determination of cost. Most of the coke in the Ruhr is produced in ordinary ovens, which produce, it seems, about two-thirds of the coke.[1] A ton of Ruhr coal gives about 70 per cent. of the same weight of coke; hence we must multiply the coal price by 1.43 to get the cost of the coal in one ton of coke. In addition to this expense, there are the costs of plant, labor and other materials than coal, besides general expenses. We may note first a few general estimates of cost. Graf Kanitz cites the statement of a technical expert in 1886 that the cost of production in the Ruhr was .60 m. for running costs and .80 m. for capital charges.[2] Since then the costs of labor and materials have risen considerably, but the technique has improved. Bergwerksdirektor Kleine reckons the cost of production in the Ruhr in 1894 (apart from the cost of coal) at 1.50 m.[3] For the Saar the following detailed official table shows the cost of producing coke in 1888–89.[4] These, again, are simply costs of operation.

[1] According to the Report of the coke syndicate for 1902 there are 8,907 ovens, of which 2,803 are equipped for by-products. There seems to be a great disparity between these official figures and those given by the Referent in the Enquete. See p. 618.

[2] Kanitz, p. 11.

[3] *Ztg. Oberschles. B.-u. H.*, 1894, p. 11.

[4] *B.-H. u. S.*, 1890, p. 129.

A. Wages,	
Superintendence	2.92
Transportation of coal	20.40
Operation of ovens	41.18
Withdrawal and separation	6.76
Quenching	19.27
Repairs	14.57
B. Materials	16.03
C. Other costs (incl. Knappschaft)	5.48
Total	126.61 pf.

Wages constitute over 90 per cent. The annual reports of Harpener, for 1900–1902, give an average cost of making coke (not including coal) at 1.15 m. per ton.[1] The considerable advance in the cost of operation in the Ruhr is undoubtedly due to the advance in wages, which for ordinary above-ground labor rose from 2.37 m. per man per shift in 1888 to 3.32 m. in 1900.[2]

Assuming, now, that the cost of coking coal is equal to the average cost of coal, and that the operating expenses are 1.15 m. per ton, we may make the following tentative estimate of the cost of coke (excluding interest).[3]

Year.	Average cost of coal. *M.*	Calculated cost of coke. *M.*	Year.	Average cost of coal. *M.*	Calculated cost of coke. *M.*
1887	4.64	7.73	1895	6.66	10.55
1888	4.80	7.95	1896	6.77	10.77
1889	5.47	8.91	1897	7.04	11.16
1890	7.98	12.50	1898	7.32	11.55
1891	8.38	13.07	1899	7.66	12.04
1892	7.38	11.64	1900	8.54	13.30
1893	6.42	10.27	1901	8.77	13.63
1894	6.38	10.21	1902	8.39	13.15

The results, thus obtained, are astonishingly and at

[1] *Glückauf*, 1901, p. 1024; *Frankfurter Ztg.*, Oct. 14, 1903.

[2] *B.-H. u. S.*, 1903, pp. 40–1.

[3] Cost of coal taken from figures of B.-H. u. S. on p. 156; cost of coke reckoned on basis of 70% production, with a cost of operation of 1.15 m.

least for all but the most recent years impossibly high, and show in the most conclusive manner that we cannot take the average cost of coal in calculating the cost of coke, as a matter of practical business. Coking-coal has always figured as a by-product in the coal business, at least until recent years, and has been sold customarily much below the average price of coal, and even below the average cost, just as a number of other grades of small coal are sold to-day. At what price it should be put in estimating the cost of coke is an arbitrary matter, and this, too, just as much if it is placed *above* as below the line of average cost. The enormous demand of recent years has tended to bring it from the category of an inferior sort to one of the more valued sorts of coal.

The relation of the production of the by-products of coke may be gotten approximately from the following data of weekly output.[1]

Ordinary Theerofen.		*Otto'schen Koksofen.*	
1200 tons coke		1450 tons coke	
30 "	tar	66 "	tar
10 "	sulphate	24 "	sulphate
4 "	benzol	12 "	benzol

The prices per ton in 1898 were as follows: tar, 20, sulphate 160 and benzol 270 marks.[2] Blast-furnace coke was 14.00 m.[3] Taking the Otto ovens, we have a total weekly product of 28,700 marks, which figured per ton output of coke gives 19.70 m. We have estimated a cost of production, with a basis of coal cost at 7.04 m. per ton, (if anything too high) at 11.57 m. This, of course, does not include the extra

[1] *Stahl u. Eisen*, 1898, p. 648.

[2] Ib.

[3] *Essen Hk.*, 1902, I p. 71.

expenses of getting the sulphate and benzol, but, on the other hand, it does not take account of the saving in fuel in the by-product oven, which is currently estimated as worth 2.31 m. per ton of coke,[1] and probably more than offsets the extra costs. It seems unlikely, therefore, that the cost would be as much as two-thirds of the value of the products. Another calculation, ready-made, which practically confirms the results we have obtained in the case above, is given by *Stahl und Eisen* as follows:[2] Assuming a cost of coal at the oven of seven marks per ton, and a weekly output of 840 tons of coke, then,

	Beehive oven.	*Coppée ordinary.*	*Coppée by-prod.*
	s. d.	*s. d.*	*s. d.*
The coal necessary for 1 ton coke costs	11 3	9 8	9 4
Labor for 1 ton coke costs	1 0	0 10	0 10
Cost per ton coke	12 3	10 6	10 2
Subtract net value of by-products	----	----	from 2 6 to 3 0
" saving in coal from gas heating	----	----	from 0 10 to 1 0
Net cost per ton coke	12 3	10 6	from 6 10 to 6 2

It should be observed that the by-product oven in this estimate gets much more coke per ton of coal than the beehive, and costs less to operate, to say nothing of the extra profits from the by-products. By a coincidence, the price we had to take for coal in the first calculation, *viz.* 7.04 m. is almost exactly the same as in this last calculation. Assuming the same price for coke in the market, we would have in this last case a net profit approximating say, 6–7 m. as before.

[1] *Stahl u. Eisen*, 1898, p. 648.

[2] *Id.*, 1899, p. 648; prices given as in original.

CHAPTER IV

PRICE POLICY

For the producer, the vital question is profits, for the consumer, prices. In general the interest of society is, that the former should be secured in a degree sufficient to stimulate enterprise, but it is very important that this should be accomplished through low costs rather than through high prices. The principal indictment against the cartells, as against all combinations, is that they are too apt to choose the latter method. Most cartells aim at price control either directly or indirectly *e.g.* by limitation of output, but that is not necessarily reprehensible, that is, it may be made necessary by cut-throat competition. On the other hand, it is easy for a cartell which possesses a monopoly to use its power to get "monopoly profits" through high prices. The coal and coke syndicates and the convention are price cartells. This applies to practically the whole sale of the coal syndicates, and to about 78% of the cartelled production in the case of the convention.[1]

Before attempting to discuss price policy, a few words concerning the statistics of prices are necessary. In the first place, we should observe that a distinction must be made between prices and average proceeds, the former is a more general term and includes the latter. Generally, however, in speaking of prices, a more or less stable quantity is understood for which a specific commodity or sort of the same is expected to sell. There are several kinds of price schedules in the coal trade, the normal (Richtpreise), the syndicate (Verrechnungspreise), the exchange quotations (Börsenpreise) the

[1] Enquete p. 345; *cf.* p. 106.

actual price in a transaction, *etc.*, all of which must be used and distinguished in discussing price policy. These schedules are very extensive of course, since there is a great variety of commercial commodities included in the general terms coal, coke *etc.* These prices are averaged by the week, month and year. They give a means of following more or less intelligently and easily the trend of business. Even for a particular sort of coal, these price schedules include a good many averages of differences. The situation may be shown most clearly by reproducing a current market report from *Glückauf*, a technical journal for mining interests.

"Essen Börse. Official report of July 13, 1903 published by the stock exchange commission, coal, coke and brikets, price quotations of the syndicate in the superior mining district of Dortmund."

Sort.	*Mine price per ton in marks.*
I. Gas u. Flammkohle.	
(a) Gasförderkohle	11.00–12.50
(b) Gasflammförderkohle	9.75–10.75
(c) Flammförderkohle	9.00– 9.75
(d) Stückkohle	12.50–14.00
(e) Halbgesiebte	12.00–13.00
(f) Nusskohle, gew. Korn I	12.50–13.25
" " II	
" " III	11.00–11.75
" " IV	9.75–10.75
(g) Nussgruskohle 0–20/30 mm.	6.50– 8.00
" 0–50/60 mm.	8.00– 9.00
(h) Gruskohle	4.00– 6.75
II. Fettkohle.	
(a) Förderkohle	9.00– 9.75
(b) Bestmeliertekohle	10.50–11.00
(c) Stückkohle	12.50–13.50
(d) Nusskohle gew. Korn I	12.50–13.50
" " II	
" " III	11.00–12.50
" " IV	9.75–10.75
(e) Kokskohle	9.50–10.00

III. Magere Kohle.	
(a) Förderkohle	7.75– 8.75
(b) Förderkohle melierte	9.50–10.10
(c) Förderkohle, aufgesiebte je nach dem Stückgehalt	11.00–12.50
(d) Stückkohle	12.50–14.00
(e) Anthrazit Nuss Korn I	17.50–19.00
" " " II	19.50–23.00
(f) Fördergrus	6.50– 7.50
(g) Gruskohle unter 10 mm.	4.00– 5.50
IV. Koks.	
(a) Hochofenkoks	15.00
(b) Giessereikoks	16.00–17.00
(c) Brechkoks I u. II	17.00–18.00
V. Briketts.	
Briketts, je nach Qualität	10.50–13.50

Glückauf, 18 July, 1903, p. 695.

These prices may continue unchanged for weeks or months, but there is room for some variation between the price limits, though these are intended primarily to cover differences in brand (*i. e.* mine).[1]

In spite of these variations in price for a particular sort, it is useful, and for statistical purposes necessary, to average them to get a general comparison. A knowledge, however, of the actual differences should be borne in mind, and ought to prevent a too wide-sweeping averaging of prices. Even to show the trend of prices, it is better to take some typical sorts, such as the run of the mine (Förderkohlen) of the different qualities. These give the best means of comparing the price movements for different years; but they do not tell much about the amounts paid for coal, because a great many varieties of higher and lower prices, and different quantities are sold. The Essen statistics of the prices of Gas-, Gasflamm-, Fett-, and Magerförderkohlen are frequently used and give a fair pic-

[1] On the Düsseldorf Börse for the same week a somewhat different list is given with slightly varying quotations; *e.g.*, Fettförder, 9.00–9.80 m. *Glückauf*, 1903, p. 695.

ture of the rise and fall of prices, but they tell nothing about proceeds. For the upper Silesian mines, it is commoner to compare prices for particular sizes. The advent of the cartells has tended to make prices more constant, especially for short periods and between different markets. The reason for this is simple enough —the prices are fixed by the syndicate and are not left to the "higgling of the market". The syndicate in fixing these prices naturally proceeds on a definite scheme of prices, (normal or Richtpreise) close to the market list, at least where outside competition does not intervene. The normal prices are provided for most of the important varieties and are more stable than the actual prices. The normal prices show best the opinions and policy of the managers of the cartell.

Proceeds are the actual receipts from sales. The proceeds of the sale of a ton of Fettförderkohle is strictly the price of a ton of Fettförderkohle, but the average proceeds per ton for the sale of many tons of different sorts of coal do not have a very useful significance as a price measure. Even for the same sort of coal, the sum of the proceeds may include very different prices from a commercial standpoint, *e.g.* wholesale, retail, export, to insiders, to outsiders, to railways, to iron producers, to coke producers, *etc.* Knowledge of the proceeds, however, is even more important than knowledge of the prices, when we come to judge of the general question of the profitableness of the business and the reasonableness of prices. We may reduce the general proceeds to proceeds per ton, just as we reduce costs to costs per ton, for purposes of comparison. Costs per ton are more legitimate statistically and from a commercial point of view than proceeds per ton. Speak-

ing roughly one kind of coal costs as much as another. The different prices of coal do not correspond generally so much to different costs as to different qualities, and the production of the low priced article often costs more, as a matter of fact, than a high priced one. The actual cost of mining cannot be figured independently for a particular sort, except when it occurs alone in the mine, but generally a mine produces several sorts.[1]

Where a coal mine produces several sorts of coal, and where in the process of separation, various grades of refinement are procured, some sorts will sell far above the average cost, and others will go for less. Thus, in the market quotations given above, the fine gas coal (Gasgruskohle) sells for 4.00–6.75, and the same sort of hard coal (Magergruskohle) for 4.00–5.50,[2] prices which are unquestionably below the average cost of production, and below the cost of production generally speaking, of any coal produced in that region. Such prices are determined like railway rates for different classes of freight by experience as to what is most profitable under the complicated conditions of joint cost and what the market will stand. From a consideration of these facts, it will be evident that a judgment of the reasonableness or unreasonableness of the prices for a particular sort of coal is not an easy matter, even when all the details of the business are known.

[1] Rheinpreussen advertises the following sorts: "*Fett-Flamm-und Esskohlen*: Stückkohlen, gew. Fett-Nuss I 45/80, II 25/45, III 15/25, IV 8/15 m/m., gew. Kokskohlen." Steinkohlenzechen, p. 44.

Consolidation advertises: "*Gas-und Gasflammkohlen*: Cannelkohlen, Gasförderkohlen, Gasflammförderkohlen, Stücke I und II, Nussgrusskohlen 0/35 mm. *Fettkohlen*: Förderkohlen, Bestmelierte, Stückkohlen, I, II und III, gew. Nuss I 45/75, II 25/45, III 15/25, IV 10/15 mm., gew. Kokskohlen." *Ib.*, p. 62.

[2] *Glückauf*, July 18, 1903.

In examining the course of prices, it is not necessary that we should go back in general more than twenty years. A brief notice of a few previous facts will suffice. The striking points in the early price changes in the Ruhr, after the beginning of coal mining on a large scale, are shown in the following table of the average prices of "run of the mine" on the Essen Börse.[1] This

1856	11.00 m.
1864	6.00 "
1869	6.40 "
1871	10.00 "
1874	15.80 "
1875	7.80 "
1878	5.00 "

period was before cartells had any significance. We observe a decline in price (which as a matter of fact was nearly continuous) from 11.00 m. in 1856 to 6.00 m. in 1864; this gradually increased, till in 1869 it was 6.40 m. and in 1870, 7.35 m. The war and the following speculative period forced the prices up rapidly till they attained the height of 15.80 m. in 1874 (far above anything in modern experience), and then sank in the following year to 7.80 m. and further in 1878 to 5.00 m. The table on the following page, of the Essen Börse prices, gives the data for the four standard qualities of "run of the mine"[2] (1883–1902).

The ten years before the organisation of the Ruhr syndicate were years of futile effort at combination, characterized in general by cut-throat competition. The prices were at a low point at the beginning of the period, and reached their deepest ebb in 1886–7. With the improvement of business, they rose in the second half of the decade, and, aided by fortuitous cir-

[1] *Bochum Hk.*, 1878, p. 2.

[2] *Essen Hk.*, 1902, I, p. 71.

	Gas. M.	*Gasflamm.* M.	*Fett.* M.	*Mager.* M.
1883	7.45	6.29	5.88	5.28
1884	7.34	6.64	5.22	4.74
1885	7.33	5.89	5.63	4.70
1886	7.19	5.85	5.60	4.90
1887	7.10	5.72	5.62	4.88
1888	7.52	6.32	6.04	5.30
1689	11.04	9.29	8.48	8.26
1890	14.58	12.36	10.72	11.00
1891	12.91	11.02	9.86	9.73
1892	11.75	9.75	8.50	7.75
1893	9.79	7.58	7.29	7.50
1894	10.50	8.70	8.00	7.50
1895	10.13	8.33	8.00	7.50
1896	10.17	8.03	8.25	7.67
1897	11.17	8.57	8.85	8.32
1898	11.46	8.84	9.08	8.59
1899	11.75	9.13	9.37	8.88
1900	12.75	10.00	10.25	9.50
1901	12.75	10.00	10.25	9,50
1902	12.00	9.72	9.60	8.75

cumstances, especially strikes, and a feverish demand, the prices were put up to about double what they were in the middle of the decade, though not as high as in 1874. At the time, some writers[1] attributed this advance to the recently organized local cartells, but this seems unwarranted. At any rate, prices fell in the following years, and in 1893, the first year of the syndicate, (the prices were made for most of the output in the year preceding), they were certainly at a moderate height.

We have recounted already with some detail the historical development of the syndicate of the Ruhr, but a brief *resumé* of its price policy will make the following criticism clearer. The normal prices (Richtpreise) give an outline of the formal policy. For a few typical sorts the development was as follows.[1]

[1] *E. g.* Kanitz, p. 16.

PRICES GIVEN IN MARKS.[1]

	1893–4	1894–5	1895–6	1896–7	1897–8	1898–9	'99–00	'00–01	1901–2	1902–3	1903–4
Fettförderkohlen	7.00	7.50	7.50	8.30	8.60	8.60	9.10	10.10	------	------	------
Fettförderschmiede	------	------	------	------	8.50[2]	9.00[2]	------	------	10.50[2]	9.50[2]	9.50[2]
Fett Nuss I	10.50	11.00	11.00	11.00	11.00	11.00	11.50	12.75	------	------	------
Fett gew. Nuss I	------	------	------	------	10.00[2]	10.50[2]	------	------	12.00[2]	12.75[2]	12.50[2]
Kokskohlen	5.50	6.00	6.50	6.50	7.00	8.00	8.50	10.50	10.00[2]	9.50[2]	9.50[2]
Ungew. Fettfeinkohlen	------	------	------	------	4.00[2]	5.00[2]	------	------	6.50[2]	6.50[2]	6.50[2]
Gasflammförderkohlen	8.00	8.50	8.50	8.75	9.25	9.25	9.75	10.75	10.75[2]	10.25[2]	10.00[2]
Gasflamm Nuss I	11.00	12.00	12.00	11.00	11.00	11.00	11.50	12.75	------	------	------
Gew. Gasflamm Nuss I	------	------	------	------	10.50[2]	11.00[2]	------	------	12.50[2]	12.75[2]	12.50[2]
Generatorkohlen	------	------	------	------	9.50[2]	9.75[2]	------	------	11.25[2]	11.25[2]	11.00[2]

[1] Denkschrift, p. 21.

[2] Enquete, p. 282.

A comparison of the normal prices of Fettförderkohle, or Gasflamm, with those of the Essen Börse shows a substantial similarity. The differences occur in favor of the actual buyer as well as against him. That such differences must appear in practical affairs has already been indicated. The situation is explained from the inside by Herr Kirdorf as follows:

"According to the normal prices, which are established by the Beirat, the Vorstand has to determine the selling prices which serve as the price basis for the business year for which the Beirat has established the normal prices. This price basis must be maintained unchanged for the business year; the Vorstand may not and cannot change them according to its will, or require more according to the opportunity of the market; but it must hold to the given price, and may depart from them only when the Beirat establishes another basis. That, nevertheless, individual variations occur in the course of the year can be easily explained, first, that in the determination of the prices of particular qualities and brands, which is very difficult, errors may occur which must be remedied. Then, also, it can very easily happen that there is an absolute necessity to raise a given brand, in spite of the fixed prices and within the limits of the same, because the equalization of participation is an absolute condition. Is a given brand too strongly demanded, and always called for, then nothing remains except that it be raised in price, so that one can sell the cheaper brands again. You can easily imagine, that with the great number of mines, with the variety which exists in the various brands, qualities and sorts, it is extraordinarily difficult, and demands a tedious labor to fix these prices. And I will not conceal the fact that many influences make themselves felt which all aim to set the prices as high as possible. The individual representatives of the mines go to the individual executive officials of the syndicate and seek to influence them. . . ."[1]

If we take the Essen prices from the beginning of the syndicate, we observe for the qualities tabulated advances of a maximum from two to three marks, or in percentages from 27 per cent. to 41 per cent.; the prices for 1902, being only 17 to 32 per cent. higher than in 1893. Except in the case of coking-coal (which according to the table of normal prices rose 91 per cent.), the results for other sorts are not widely dif-

[1] *Cent. Verb. D. Indust.*, 1901, p. 233.

ferent. In fact, only for Siebgruskohlen does there seem to have been anything like the advance for coking-coal.

The statistics of prices for Upper Silesian coal are not so extensive as those of the Ruhr. The following tables will give a tolerably complete view of their course. The reasons for the lack of extensive price statistics of a public character seems to be, first, that there are fewer varieties of coal produced, and, second, that what does not go directly to metallurgical works in the district appears in trade almost entirely in the hands of certain large dealers.

UPPER SILESIA, AVERAGE MINE PRICE IN MARKS.

	Gaskohle[1]		*Flammkohlen*[2]	
Year.	*Stück.*		*Stück.*	*Klein.*
1883	6.2		—	—
1884	6.1		—	—
1885	5.9		—	—
1886	6.0		—	—
1887	5.9		—	—
1888	5.9		6.4	3.2
1889	7.0		7.3	4.4
1890	9.5		9.2	6.2
1891	9.2		9.0	6.0
1892	9.1		8.7	5.4
1893	9.0		8.6	5.6
1894	9.0		8.6	5.6
1895	9.0		8.6	5.6
1896	8.9		8.6	5.6
1897	8.7		8.8	5.8
1898	9.1		9.1	6.0
1899	9.8		9.8	6.7
1900	11.0		11.6	8.2
1901	11.8		11.6	8.4
1902	11.7		11.4	7.8
1903	—		11.4	7.8

It is noticeable that the rise in price in 1890 (which was the year of the formation of the convention) was

[1] *Vierteljahrshefte*, 1903, I, p. 21.

[2] Furnished through courtesy of Emanuel Friedlaender & Co.

not followed by so much of a decline in the succeeding years as in other parts of Prussia. Another table covering this important transition period, including other coal prices, given by *Glückauf*, is as follows.

	Stück u. Würfel. M.	*Erbs.* M.	*Klein.* M.
Jan. 1889	5.50–6.50	3.40–4.50	3.00–4.00
Apr. 1889	6.00	4.00	3.50
Sept. 1889	7.50–9.00	5.50–6.50	4.00–6.50
Mar. 1890	9.00	7.50	6.00
Dec. 1890	8.50	7.00	6.00
Dec. 1891	8.50	6.75	5.60
Dec. 1892	8.00–8.50	6.50	5.00–5.50

Comparing again the general table of coal prices in Upper Silesia (p. 184), we find a relatively small decline, for the years 1896–7, was followed by an advance which culminated in 1901, almost as great as in the *hausse* of 1890. The price advances for the lowest grades of coal were much greater, and must be criticised from a different standpoint. A few years ago they were regarded as comparatively worthless, and were generally consigned to the dump-heap, today they have a considerable application in industry.[2] Some of these sorts therefore advanced as much as 300% in price, as may be seen in the following table.[3]

Year.	Paulus Staubkohle.		Rudaer Mischkohle.	
	Date.	Price. *M.*	Date.	Price. *M.*
1890	Jan. 1	1.30	Jan. 1	1.30
1890	Oct. 1	1.70	Apr. 1	1.80
1891	Oct. 1	1.80	Jan. 1	3.00
1892			July 1	2.80
1893	Oct. 1	1.70	Jan. 1	2.60
1895	Oct. 1	1.80	July 1	2.45
1897	Oct. 1	2.10	July 1	2.70
1898			July 1	2.80
1899	Jan. 1	2.60	July 1	3.20
1900	Jan. 1	3.00	July 1	4.00
1901	Jan. 1	3.90	July 1	4.40
1902			July 1	4.00

[1] *Glückauf*, 27 Oct., 1900, p. 98.

[2] Enquete, p. 478.

[3] Enquete, pp. 582–3.

The data for the cartell prices of the Upper Silesian convention are very meagre. We have already had occasion to note that the convention is a price cartell only in fixing a minimum price; it does not attempt to fix the actual price, much less does it manage the sale as the Ruhr syndidate does.[1] As a matter of fact these minimum prices have generally been considerably below the actual market prices. General-Direktor Williger the president of the convention states that for thirteen years the minimum price for the best sorts had been 37 pf. per Zentner, or 7.40 m. per ton. This was subsequently raised as follows:[2]

	1898	stood at	7.40 m.
Spring	1898	raised to	7.80 "
"	1899	"	8.20 "
Autumn	1899	"	8.60 "
Spring	1900	"	9.60 "
Autumn	1900	"	10.00 "

Since then reduced somewhat.

The advance in the minimum price between 1898 and 1900 was 35.1 per cent.; the average annual price for gas coal rose 35.6 per cent. between 1897 and 1901. The minimum prices are frankly declared to be determined by market conditions, and not the cost of production.[3] Coking-coal experienced a considerable advance with the rest. It seems that the price for the fiscal mine, Königin Luise, in the first half of 1899 was 6.30 m., and for the first of January, 1900, 7.50 m.[4] This appears to have been the general price also which advanced by July, 1900, to 8.00 m.,[5] or about 26.9 per cent. in a year and a half. Heavy reductions were

[1] Enquete, p. 329.

[2] Enquete, p. 360 (calculated from data given.)

[3] Williger, Enquete, p. 349; *cf.* p. 329.

[4] *Oppeln Hk.*, 1899, p. 11.

[5] *Oppeln Hk.*, 1900, p. 19.

made in the two following years, and for the Königin Luise the price on July 1, 1901, stood at 7.50 m. and on January 1, 1902, at 6.50 m.[1] It has been claimed that the price reduction of metallurgical coal was retarded by the iron interests (which own mines and are identified with the convention) in order to prevent rival iron manufacturers from getting cheaper coal.[2]

The criticism of the policy of the fiscus is of great importance in the analysis of the coal industry. It is unfortunate from this standpoint, that greater openness and publicity have not been practiced heretofore in their commercial dealings.[3] For general purposes of comparison, however, the following table for two important sorts will be sufficient for the mines of the Saar.[4]

	Fiscal Saar.			*Fiscal Saar.*	
Year.	*Flamm.*	*Fett.*	*Year.*	*Flamm.*	*Fett.*
	M.	*M.*		*M.*	*M.*
1883	7.8	7.7	1893	9.9	8.5
1884	8.2	7.6	1894	9.7	8.2
1885	7.9	7.4	1895	9.6	8.3
1886	7.9	7.4	1896	9.4	8.4
1887	7.6	7.3	1897	9.7	8.8
1888	7.5	7.4	1898	9.8	9.0
1889	8.1	8.3	1899	10.5	9.7
1890	10.7	10.9	1900	11.9	11.4
1891	10.4	10.3	1901	12.8	12.5
1892	10.4	9.5	1902	12.1	11.5

A comparison of this table with the Essen quotations shows a range of prices averaging higher, though the advances of prices in the periods of *hochconjunktur* were not so great, before the syndicate was formed, but greater after. Thus the average price (for the period given) of Flamm was, for the fiscal Saar, 9.6 m.. and for

[1] *Oppeln Hk.*, 1901, p. 66.

[2] Enquete, p. 469. On page 477 Herr Williger states that the outsiders constitute 30–40% of the producers of iron.

[3] Reichstag, 1900, p. 364; *cf.* Laur, II, 122.

[4] *Vierteljahrshefte*, 1903, I, p. 21.

the Ruhr 8.4 m., while Fett was 9.0 m. and 8.0 m. respectively. In the period from 1888 to 1890, Fettkohlen rose in the Saar 47.3 per cent., and in the Ruhr 78.3 per cent. In the period from 1898 to 1901 the same coal rose in the Saar 38.9 per cent., and in the Ruhr 13.2 per cent.[1] Prices in the Saar are fixed generally for the semester from January or July 1;[2] these take the position of normal prices for that term. Such a list is published now, and from a recent one, which appeared in *Glückauf* on May 23, 1903, the following characteristic prices are extracted. It should be stated that in the Saar the coal is specified by mines as well as the usual names for sorts. The coal listed is for railroad use.[3]

Flammförderkohlen :	
Kohlwald halbgesiebte	12.80 m.
Griesborn abgesiebte	12.00 "
III. Sorte (lowest.)	
Kohlwald, Göttelborn	7.20 m.
Fettkohlen :	
I. Sorte.	
Heinitz-Dechen (highest)	16.50 m.
II. Sorte.	
Maybach, Brefeld (lowest)	10.20 m.

For the two sorts of coal for which the prices were given for the last twenty years, namely, Fett and Flamm, (see p. 187), we have already seen a general higher average for the Saar than for the Ruhr. This is a frequent subject of criticism and complaint. Thus Herr Böckel says that the prices of Fettnusskohlen II in the Saar and the Ruhr are 15.50 m. and 12.75 m. re-

[1] *Vierteljahrshefte*, 1903, I, p. 21. The figures given for Fettkohlen for the Ruhr are 1888, 6.0 m.; 1890, 10.7 m.; 1898, 9.1 m.; 1901, 10.3 m. The figures here are slightly different from those of the Essen Börse given in *Essen Handelskammer Reports*.

[2] Abgeord., X Commission, p. 12.

[3] *Glückauf*, 23 May, 1903, p. 499.

spectively,[1] while Herr Paache complains that the Ruhr sells locomotive coal for 11.10 m. while the Saar gets 15.00 m.[2] Even greater differences are shown by Dr. Beumer in the Enquete.[3] In the case of locomotive coal, the public interest can be only an indirect one —high coal prices make dear transportation, and help to excuse high railway tariffs. Nothing hardly could give a better justification of cartell price policy before government inquiry than the fiscal price policy, and the cartell leaders have realized it thoroughly.[4]

The course of prices for the fiscal mines of Upper Silesia is substantially the same as for the private mines. The price-making of the fiscus is technically independent, but practically, it follows in most cases the price policy of the convention.[5] An exception to the general statement appears in the case of coking coal, which is mostly fiscal, and where naturally the fiscus has more influence in price making.[6] The prices of the fiscal mines, as well as the private mines, were raised in 1901,

[1] Reichstag, 1900, p. 364.

[2] Reichstag, 1900, p. 1331.

[3] Enquete, p. 85.

[4] Enquete, pp. 85, 183; *Cent. Verb. D. Indust.*, 1901, p. 236.

[5] Enquete, pp. 344, 348. General Director Williger says: "The fiscus, according to my feeling, takes, let us say, a benevolent attitude towards the convention. (Laughter.) It is not a member, and is not officially invited to the meetings. However, I am permitted, as chairman, to inform the gentlemen who direct it. It has also happened that the gentlemen have been present, and have dined with us." Enquete, p. 344. General Director Bernhardi says: "The relation to the fiscus is very complicated. . . . Nevertheless the situation in general is as follows: the fiscus in reference to the prices of the convention must follow. The fiscus is not in the position to hold prices higher than we, or else its sales decline; and it does not go under our prices worth mentioning." Enquete, p. 348. It is understood between the private mines and the fiscus that the former shall fix the price of Flammkohle. Enquete, p. 468.

[6] Enquete, p. 463.

although the crisis had already made itself severely felt. In the fiscal Saar, on the other hand, the first reduction came in 1901[1] In Silesia most of the good coking-coal is furnished by the fiscus and the prices for the same under its influence, showed a decided advance (see p. 186). However the fiscus sometimes sells below the prices of the convention.[2] On the whole the fiscal prices in Upper Silesia (on account of their better quality) run higher.[3]

Comparing the fiscus generally with the syndicate or the convention, the judgment would be that there is not much difference between them—if anything the fiscus has put prices up more—as Herr Gothein says it has been "too much the fiscus," and has not paid enough attention to general welfare.[4] Herr Kirdorf thinks that, at any rate, the syndicate is better than the fiscus.[5]

The price history of Lower Silesia presents nothing new. The general facts are shown by the average annual mine price of gas coal from 1883 to 1902.[6] From

1883	9.9 m.	1893	12.6 m.
1884	9.9 "	1894	12.6 "
1885	9.9 "	1895	12.6 "
1886	9,9 "	1896	12.6 "
1887	9.9 "	1897	12.8 "
1888	9.8 "	1898	13.1 "
1889	10.9 "	1899	13.7 "
1890	13.4 "	1900	17.1 "
1891	12.8 "	1901	17.8 "
1892	12.7 "	1902	16.5 "

[1] *Saarbrücken, Hk.*, 1901, p. 8.

[2] Enquete, pp. 592, 182.

[3] Debate of 19th Feb., 1901, over Etat, in Beilage, p. 15, *Glückauf*, 2 March, 1901.

[4] Enquete, pp. 182, 70–1.

[5] *Ib.* pp. 185–7.

[6] *Vierteljahrshefte*, 1903, I, p. 21.

1896 to 1901 we have a rise of 41.3 per cent. This shows a more rapid advancing tendency, which, according to the view expressed in the annual report of the Aeltesten der Kaufmannschaft, of Berlin, is characteristic of the non-cartelled regions.[1] For Lower Silesia *Glückauf* gives quotations for 1900 for Kleinkohlen of 9–10 m., and for Schmiedekohlen 15–19 m.[2]

Respecting the price policy of the outsiders of the Ruhr, there is little to be said, but that is of some importance. The prices of the Essen Börse are substantially the syndicate prices.[3] The general statement is true that the non-syndicate mines get the syndicate prices,[4] and they recognize that a fair policy is pursued towards them by the syndicate,[5] but when the opportunity offers, they break away from the fixed prices of the syndicate and take what the circumstances permit. Thus Abg. Hilbe asserts that recently, when the syndicate was selling at 11.10 m., the outsiders got 13.50 m. to 14.40 m.[6] The syndicate complains in its report of 1899 that, while it has maintained fixed prices, the outsiders have made "usurious" exactions.[7] On the other hand, if sales are difficult, they can shave the syndicate prices, which are known and not easily changed and so make a sale. This was the situation for example in 1901, 1902.[8] As Herr Kirdorf says the syndicate is compelled to

[1] *Bericht d. Aeltesten*, 1900, p. 12.

[2] *Glückauf*, 17 Aug., 1901, p. 714.

[3] Enquete, p. 127.

[4] *Ib.* p. 71.

[5] *Ib.* p. 71.

[6] Reichstag, 1900, p. 288.

[7] *Cf.* Report, 1899, in *Essen Hk.*, p. 11.

[8] *Zeits. Preuss. Stat. Bureaus*, 1903, p. 8; Enquete, pp. 80–1; Raffalovich, p. 17.

permit the outsiders "to have their fill"[1] right in the coal district itself.

The question of coke prices is chiefly a question of the price policy of the coke syndicate. The course of prices for coke was as follows:

Düsseldorf.[2]			Essen Börse.[3]			
		Hochofen.	Year.	Hochofen.	Giesserei.	Brech I–II.
		m.		*m.*	*m.*	*m.*
Begin.	1880	20.00	1887	7.83	8.67	8.32
"	1881	8.20	1888	9.16	10.36	10.78
"	1882	11.60	1889	15.72	17.00	17.69
"	1883	12.50	1890	19.78	22.00	22.61
"	1884	8.00	1891	13.50	17.00	18.00
"	1885	7.30	1892	12.00	14.63	16.25
"	1886	7.60	1893	11.00	14.00	15.25
End.	1886	5.60	1894	11.00	14.00	15.25
Begin.	1887	6.60	1895	11.00	14.00	15.25
"	1888	8.30	1896	12.02	14.23	15.19
"	1889	9.50	1897	13.87	15.96	15.64
"	1890	26.00	1898	14.00	16.25	16.75
			1899	14.37	16.69	17.27
			1900	21.29	23.33	24.37
			1901	22.00	23.50	24.50
			1902	15.00	17.50	18.50

These prices after 1890 are practically those of the syndicate.[4] Taking the prices of blast furnace coke from 1891 to 1892, we observe a decline of about 22.7 per cent. up to 1895. With the upward movement of industry comes an advance, which is at first moderate, but concludes with a great leap forward in 1900, an advance of 48.1 per cent. over the preceding year. This is increased a little in the year following, and then drops back to about the former level. From the lowest point (1893–5) to the highest (1901) point, the advance was 100 per cent. The price changes in the other sorts of coke followed the same direction, but were not

[1] Enquete, p. 78.

[2] *Id.*, p. 637.

[3] *Essen Hk.*, 1902, I, p. 71.

[4] Enquete, p. 127.

so great—the advance for the most important sort foundry coke between 1895 and 1901 was from 14.00 m. to 23.50 m., *i.e.*, 67.8 per cent. Comparing the price movement in this period with the preceding period of high prices, we find the latter even more extreme. This, it will be remembered, occurred before the present cartell was organized. Prices advanced on the Essen Börse for blast furnace coke from 7.83 m. in 1887 to 19.78 m. in 1890 or about 127.1 per cent. On the Düsseldorf Börse prices were considerably lower in 1886. The sudden character of the advance in 1890, and the effect of the formation of the cartell is shown further, if we examine the monthly price changes.[1] The

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1889	10.00	10.00	10.50	11.00	. .	. .	. .	. .	18.00	19.25	22.00	25.00
1890	27.75	29.75	26.50	25.50	. .	. .	. .	13.75	13.75	13.75	14.00	13.50
1891	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50

change in 1889–90 was much more startling, therefore, as well as higher than in 1900. The equally sudden acquisition of comparative equability under the syndicate in 1890, on the other hand, was due quite as much to the change in the *conjunktur* as to the moderation of the cartell leaders.

We have already spoken of (p. 64) the so-called two year fusion price. The contracts for 1900 had been made at a price of 14.00 m., but the pressure for coke became so strong that it was determined to make a large advance. Those who already had contracted for 1900 at 14.00 m. were offered, in the autumn of 1899, amended contracts covering two years, *viz.*, 1900 and 1901, at a price of 17.00 m.[2] It has sometimes been put as though there were two prices, 14.00 m. for 1900, and 20.00 m. for 1901, and for those who took the two

[1] *Essen Hk.*, 1889, p. 45; 1890, p. 33; 1891, p. 26.

[2] Enquete, pp. 638–40.

year contract an average of 17.00 m.[1] This, however, is not the correct position as is shown by the statement of Direktor Plehn, a member of the Vorstand of the syndicate.[2] As a matter of fact those who bought in 1901 had to pay 22.00 m.[3] The table of normal prices bears out Herr Plehn; the Essen Börse quotations show what the current prices were.

The coke price obviously has a pretty intimate connection with the price of coal. In the recent Enquete, Herr Stinnes asserted that, practically, the coke price regulated the coal price, because the latter was determined for Jan. 1, and the former for Apr. 1, and the coking coal price had to be brought into proper relation to the coke price and to the prices for other sorts of coal.[4] This seems a good deal like putting the cart before the horse. Three points may be made against this contention, first that the coal interests dominate the coke interests and include them; the influential producers of Fett coal have, nevertheless, an interest in the coke business which may be antagonistic to the general coal interests; second, the prices of coal have not taken exactly the same course as coke prices; an inspection of the price tables will show that coke did not advance at first when coking-coal advanced, and later coke had a greater advance than coal[5]; third, the

[1] Enquete, p. 646.

"The price of 20 m. may be obtained by calculation, as follows: 14 m. for 1900 + 20 m. for 1901 makes 17 m. for both years; actually, however, the price of 20 m. was never mentioned, but a unitary price of 17 m. was established for both years."

[2] Enquete, p. 660.

[3] *Ib.* p. 660.

[4] *Ib.* p. 65.

[5] Thus in 1894–5 coking coal was advanced from 5.50 to 6.00 m., while blast furnace coke remained at 11.00 m.

price periods have not always coincided.[1] Herr Kirdorf admits indeed the justness of the claim of Herr Stinnes in a limited sense, and cites a case of the price of coking-coal being fixed for a half year only, while the rest was fixed as usual for a year.[2]

The normal coke prices (Verrechnungspreise) are determined by the Aufsichtsrat. The table of syndicate prices for the principal sorts of coke for the twelve years of the syndicate is given below.[3] Taking 17 m.

Year.	Blast furnace.	Foundry.	Brech I–II over 30 mm.	Brech III over 20 mm.	Brech IV under 20 mm.
1890	13.00	15.00	16.00	10.00	6.00
1891	13.00	15.00	16.00	10.00	6.00
1892	12.00	14.00	15.00	9.00	5.00
1893	11.00	13.00	13.50	8.00	5.00
1894	11.00	13.00	13.50	8.00	5.00
1895	11.00	13.00	13.50	8.00	5.00
1896 I Sem.	11.00	13.00	13.50	8.00	5.00
1896 II "	11.50	13.00	13.50	8.00	5.00
1897 I Sem.	12.00	13.50	14.00	10.00	6.00
1897 II "	12.50	13.50	14.00	10.00	6.00
1898	14.00	15.00	15.50	12.00	6.50
1899	14.00	15.00	15.50	12.00	6.50
1900	17.00	18.50	19.00	14.00	7.00
1901	17.00	21.50	22.00	15.00	7.00
1902	15.00	17.00	18.00	13.00	6.50
1903 I Sem.	15.00	16.00	{ 17.00 { 16.50	12.00	6.50

as the highest price for blast furnace coke (as given in the table), the total percentage advance over the lowest was 54.5 per cent. taking effect in the course of four years. This was much higher than the advance of normal prices in the coal syndicate.

[1] In 1896 the price of coking coal was fixed for the year, while coke was advanced in the middle of the year from 11.00 to 11.50 m.; similarly in 1897. The term of the coke price had run out when the price for cooking coal had run for only one-quarter of its term. Enquete, p. 67.

[2] Enquete, p. 68.

[3] *Id.*, p. 793.

We have to consider coke prices in only two other directions, namely, the outsiders of the Ruhr and the fiscal Saar. In Silesia the coke production has not been cartelled for any length of time; the Silesian fiscus is not important enough in coke to demand a special discussion, and the material, moreover, is too scanty to make a discussion of the price policy worth while. If the outsiders of the Ruhr have made a good thing of it in the coal market, they seem to have done considerably better with coke. The coke syndicate complains in its annual report for 1900 that outside coke producers, as well as dealers, put up the price in an exorbitant manner, and that the syndicate got the blame for it.[1] In the Enquete, Direktor Plehn states that outsiders exacted 22 m. as early as April, 1899, (when the "fusion price" was first under consideration); in August the non-syndicate mines of the Ruhr required 27 m., and it is asserted specifically of the great Haniel mines, Rheinpreussen and Neumühl, that large orders were taken at 35 m. Herr Plehn says:[2]

"So from this standpoint the prices which the syndicate exacted are much more moderate than the prices which have been demanded in other quarters. In the case of non-syndicate mines, no purchaser can claim there was compulsion; it was business which anyone could do or not."

Such prices were possible, of course, owing to the shortage in coke; the syndicate was selling at that time whatever it had to sell for 22 m. in the same territory.

The policy of the fiscus of the Saar gives us the best basis for criticism and comparison of the policy of the coke syndicate. Unfortunately, tables of prices are not at hand, but the average proceeds in this case furnish a

[1] Bericht, 1900, p. 3.

[2] Enquete, pp. 659–660. See also pp. 672–3.

fair substitute, which we may compare with those of the Ruhr.

COKE—AVERAGE PROCEEDS PER TON.

	Saar.[1]	*Ruhr.*[2]		*Saar.*	*Ruhr.*
1890	21.26 m.	—— m.	1897	15.19 m.	11.60 m.[3]
1891	16.46 "	13.11 "	1898	15.68 "	13.02 "
1892	15.11 "	10.86 "	1899	16.96 "	13.29 "
1893	11.59 "	8.99 "	1900	20.73 "	16.59 "
1894	11.60 "	8.77 "	1901	20.36 "	18.00 "
1895	12.97 "	9.35 "	1902	—— "	15.28 "
1896	13.66 "	10.10 "			

[1] *Berg-Hütten u. Salinen.* [2] Reckoned from data in Ber. d. Koks-syndicats. [3] *Ztg. O. B.-u. H. Ver.*, 1897, p. 202.

On this basis of comparison the coke syndicate does not make a bad showing. Of course the fiscus did not have an entirely free hand—its small output could not be sold above the market price in times of low *conjunctur*, but it was not obliged to sell *over* the syndicate as it did in 1889–1901.

If we compare the prices of coal and coke in Germany with the prices in other countries, we shall find greater steadiness in the former, and on the whole, a lower scale. In cheapness of production, Germany compares favorably with England and has an advantage over all other European producers.[1]

We may first note the effect of the upward movement of 1890 on English and Belgian prices.

English prices (*s. and d.*)

Date.	*Gas coal.*	*House coal.*	*Foundry coke.*
Jan. 1889	6/6	6/6	13
April 1889	7/6	7/6	14/6
Sept. 1889	15	12/6	34
Mar. 1890	16	14/6	34
Dec. 1890	11	13/6	22
Dec. 1891	9/6	12	17
Dec. 1892	7	9–10/6	13–14

[1] *Cf.*, *Zeits. f. Gewinnung u. Verw. d. Braunkohlen*, 1902–3, p. 482. The United States shows, however, a marked superiority in this respect which is attributed partly to the use of mining machines.

Belgian prices (*francs.*)

Date.	*Mager.*	*Fett.*	*Hoch-ofencoks.*
Jan. 1889	6–6.50	7.50–8	12
April 1889	7.50	8.50	13
Dec. 1889	13–14.50	17	30–35
Mar. 1890	15	18.50	35
Dec. 1890	9	12	16.50
Dec. 1891	8	11	14
Dec. 1892	7	9.50–10	10.50–11

For comparison we give prices for the Ruhr for the same dates.

Ruhr prices (*marks.*)

Date.	*Gas-kohlen.*	*Koks-kohlen.*	*Flamm-förder.*	*Hoch-ofencoks.*
Jan. 1889	8–8.50	5.50–6	6.50–7	9.75–10.50
April 1889	9	6.50–7	7.50	12
Dec. 1889	15–15.50	12.50–13	12.50–14	25–28
Mar. 1890	17	12	15	29
Dec. 1890	13	9	10.50	13.50
Dec. 1891	12	7	9.50	12.00
Dec. 1892	10–12	5–7.50	7–8	10.50–11

Glückauf, 1900, 27 Oct., pp. 918–19.

An inspection of these tables shows that the upward movement was not quite so great in Germany as in England or Belgium. This is especially noticeable for coke. Except in the early seventies, there has been no advance in Germany equal to this.

Coming now to the second boom period, we may offer first a comparison between Belgium and Germany, in the price of locomotive coal sold to the state railways.[1]

Belgium.		*Ruhr Syndicate.*	
1895 Mar.	9.20 fcs.	1895 II Sem.	8.50 marks.
1895 June	9.60 "	1896 I "	8.50 "
1896	9.65 "	1896 II "	9.00 "
1897	11.18 "	1897 I "	9.00 "
1898 Mar.	11.45 "	1897 II "	9.00 "
1898 Aug.	11.55 "	1898 I "	9.00 "
1899 Apr.	14.30 "	1898 II "	9.60 "
1899 Oct.	17.50 "	1899 I "	9.60 "
1900 Feb.	22.50 "	1899 II "	9.60 "
1900 June	22.50 "	1900 I "	9.60 "
		1900 II "	11.10 "

[1] Bericht d. Rhein.-Westf. Kohlen Syndicats, 1900, p. 13.

A glance at this table shows the great moderation of the Ruhr syndicate in comparison with the Belgian. In this second period of *hochconjunktur* the course of English prices was as follows:[1]

		s. d.
Gas Coal	Begin. 1898	7/3– 7/6
	Oct. 1898	10/6
	Jan. 1900	16/6–17/6
Steam coal	Begin. 1898	8/3– 8/6
	July 1898	12/6– 13
	Jan. 1900	16
House fuel	Begin. 1898	8/6
	Sept. 1898	15
	Dec. 1899	16
Steam, small	Begin. 1898	4
	Aug. 1898	7/9
	Dec. 1899	8/6
	Mar. 1900	11/6

Here again a comparison with the syndicate or the convention is unfavorable to the English mines. English coal in Cardiff rose from 16 s. in Sept. 1898 to 30–35 s. at the end of 1900.[2] The difficulty here was chiefly a railroad strike in Wales which cut off a large part of the Welsh production from the market.[3] For the year the average contract price according to *Glückauf* were 13/6*s.*, but they were run up in the open market to 25 and 28*s.* Coke was steady at the end of the year at 20/6–21/0*s.*[4] In April, 1901, blast furnace coke had fallen to 14–14/6*s.*[5] For comparison with German prices we may note the following quotations in 1903:[6]

English coal prices (*s. and d.*)

Northumberland, best gas coal	9 – 9/3
" foundry coke	17/6–18/0
Cardiff, best sorts	14/9–15/3
Monmouth, best half-bituminous	13 –13/9
" blast furnace coke	17/6–18
" foundry coke	19/6–20
Newcastle, best steam coal, Tyne f. o. b.	10/7½

[1] *Glückauf*, 27 Oct., 1900, p. 918.

[2] Enquete, p. 119.

[3] Bericht d. Rh.-Westf. Kohlen Syndicats, 1900, p. 6.

[4] *Glückauf*, Jan. 19, 1901.

[5] *Ib.* April 20, 1901.

[6] *Ib.* July 4, 1903, pp. 676–8.

The general course of English prices (including all sorts of coal) for three important markets was as follows:[1]

Year.	*Northumberland.*		*Durham.*		*So. Wales and Monmouthshire.*	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*
1883	5	1.93	4	11.18	9	8.36
1884	5	1.63	4	8.21	9	10.47
1885	4	10.70	4	6.74	9	3.37
1886	4	7.17	4	5.12	8	4.77
1887	4	7.20	4	5.34	8	0.25
1888	4	4.01	4	5.31	8	4.22
1889	5	4.70	5	1.77	10	5.38
1890	7	7.65	7	3.49	12	0.30
1891	7	4.06	6	11.63	13	4.89
1892	6	6.50	6	2.39	11	6.84
1893	5	11.35	5	6.60	9	8.68
1894	6	5.99	5	5.38	10	9.34
1895	5	6.68	5	1.49	9	6.95
1896	5	0.74	5	1.21	9	1.70
1897	5	2.91	5	3.80	9	2.84
1898	6	1.36	5	9.71	10	1.71
1899	7	0.69	6	11.04	11	0.86
1900	10	3.57	10	3.72	15	2.00
1901	8	9.33	8	6.73	16	0.57
1902	7	4.98	7	3.79	13	6.69

A comparison of these English price statistics with those of the Ruhr is on the whole quite favorable to the latter. The English prices are more variable and follow the fluctuations of industrial activity more closely.

The general course of prices in Belgium is shown in the following table of the average prices at Charleroi:[2]

	1896.	*1897.*	*1898.*	*1899.*	*1900.*
Menus gras Type II . .	9.65 fcs.	11.18 fcs.	11.55 fcs.	17.50 fcs.	22.50 fcs.
" demi " " IV . .	8.86 "	9.91 "	10.95 "	16.00 "	21.00 "
" quart " " III . .	8.00 "	9.00 "	9.90 "	15.00 "	20.00 "
" maigres " II . .	6.70 "	7.73 "	8.24 "	13.25 "	17.81 "

The general average mine price of coal in France is given as follows:[2]

[1] *Colliery Guardian*, 1903.

[2] Villain, p. 139.

[2] *Ztg. Oberschl. B. u. H. Ver.*, 1903, p. 225.

1885	11.73 fcs.
1890	11.94 "
1895	11.01 "
1900	14.95 "

The average mine prices for coal for three of the principal districts of France in 1899 and 1900 were

	1899	*1900*
Nord and Pas de Calais	11.78 fcs.	14.60 fcs.
Loire	15.25 "	18.02 "
Gard	13.49 "	15.26 "

The average price to the railways was 17.51 fcs. in 1899, 21.14 fcs. in 1900.[1] These are much higher than those obtained in any of the German cartells for railway coal (*cf.* p. 198), though not much higher than the fiscus of the Saar. In 1901 the prices were considerably higher in Pas de Calais and Nord than in the Ruhr. From a price list for August, 1901, it appears that the Fettkohlen ranged from 15 to 30 fcs. and the Halbfett from 15 to 31 fcs. Blast furnace coke was 45 fcs.[2] At that time the price norms for Fettkohlen in the Ruhr ranged from 7.50 m. to 12.50, and Esskohlen from 7.50 m. to 13.50 m.[3] The official view expressed by M. Baudin, minister of public works, was that the *hausse* was not due to an *entente* among the coal producers, but to general industrial conditions.[4] The situation in 1903 is similar. On the new contracts the French prices for Fettförderkohlen with 25 per cent. Stücke run from 16.00 to 17.50 fcs. (about 10.50–11.00 m. in the Ruhr) and for Halbfett 17.50 to 19.50 fcs. (about 9.50–10.00 m. in the Ruhr). Stückkohle is quoted at 31–32 fcs., (12.50 to 13.50 m. in the Ruhr).

[1] *Zeitung Oberschl. B. u. H. Ver.*, 1902, p. 570.

[2] *Glückauf*, Aug. 10, 1901.

[3] Enquete, pp. 282–4.

[4] Savoye, p. 34.

These French prices are subject to some reduction, for the industrial sorts, for large orders.[1]

These facts are sufficient to show that, not only the advances in prices, both in 1890 and in 1900 were general, and not due to local causes,[2] but that the price advances were higher in other countries than in Germany. This, indeed, is recognized even by some of the opponents of the syndicates.[3]

So far, in speaking of prices, we have had to do almost entirely with non-competitive conditions. Within reasonable limits we may say that it is impossible for the Ruhr to compete in Silesia, or for Silesia to compete in the Ruhr or Saar. In general the great producing regions have complete control of their respective localities, and the organization of production, is such that the prices are hardly competitive. But, as we have seen, these regions sell coal outside of their respective localities, and in most cases they have to meet rival producers. For the examination of the price policy of the various coal producers in the competitive districts, it will be convenient to consider the subject under two heads, first, domestic, second, foreign.

In the undisputed territory of the Ruhr, the price policy is fixed, in general, by the price norms, in the disputed territory, the goods are sold for what they will bring under conditions of competition. The borders of the undisputed territory are Holland, East Friesland and Hamburg on the north, the Elbe on the east, Bavaria (it seems) on the south, and Belgium and Luxemburg on the west.[4] The borders of this region are not

[1] *Glückauf*, Feb. 14, 1903, p. 141.

[2] *Cf.* Minister of Trade and Industry Brefeld, Abgeord., 1900, p. 840.

[3] Calwer, 1900, p. 94.

[4] *Cf.* Enquete, p. 70.

definitely fixed and freight rates play an important *rôle*. In the competitive regions the price policy is elastic; generally the prices are less, but sometimes they are *higher*, than in the undisputed region. This is asserted specifically of the Hamburg market where the Ruhr competes with English coal; the extra gains have been considerable.[1] On the whole, of course, there is a loss on the sale, as compared with the price norms, and this must be made up to the individual parties, whose coal is sold, at the general expense. In the second half of 1901, for example, it appears that the syndicate was selling the best sorts of coal in the region of the lower Elbe and Weser at 20% discount on the standard prices.[2]

The situation in Upper Silesia is somewhat different, because at the outset only a minimum price is fixed, and this is below the ordinary market price; the mines sell their output individually, and can raise the prices as much as they please, but they cannot sell below. To this last statement exception is made in the case of sales to the Baltic or North Seas, where in some cases a reduction of the minimum price is allowed,[3] and further in certain cases where Bohemian coal penetrates into the German market.[4]

The practice of the fiscus, at least in the Saar, is substantially similar to the policy of the Ruhr syndicate, namely, a reduction in prices where competition makes it necessary.[5]

[1] Enquete, pp. 71–2. See p. 000.

[2] *Allgemeine Ztg.*, 8 Sept., 1901.

[3] This policy was practiced before the organization of the Convention. Enquete, p. 709.

[4] Enquete, pp. 357, 346–7.

[5] *Ib.* pp. 70–1.

A similar practice exists also in the sales of the coke syndicate; in general higher prices in the local undisputed region than in the more distant competitive fields.[1]

How this policy of price reduction operates practically can be judged from one or two illustrations. Let us take, first, the Hamburg market where English and Ruhr coal are the principal competitors. The Hamburg coal imports were:[2]

	English.	*Ruhr.*
1893	1,596,136 tons.	1,003,590 tons.
1897	2,156,000 "	1,452,090 "
1900	3,019,400 "	1,598,200 "
1902	2,792,822 "	1,773,800 "

The competition has always been very sharp here, and we may note that recently the high price policy of the syndicate drove some of the largest Hamburg customers, *viz.*, Hamburg-Amerika Linie, Hamburg-Südamerikanischen Dampfschiffahrtsgesellschaft and Deutsch-Amerikanische Petroleumgesellschaft to other (chiefly English) quarters.[3]

The following table gives official statistics of the prices of competing sorts of English and Westphalian coal in the Hamburg market. The fifth column gives the Hamburg price for the Westphalian Nuss, minus the transportation cost (Enquete, page 509) which is compared with the normal (approx. local) price. The prices of the English and Westphalian coals naturally move up and down together according to the *conjunctur*. It appears from the second part of the table that in 1895–6 the syndicate reduced its prices to increase its trade in Hamburg, while with the strong

[1] *Ib.* p. 707.

[2] Ber. Rh. Westf. Kohl. Synd., 1902, p. 12.

[3] *Zeits. d. k. Preuss. Stat. Bureau*, 1903, p. 8.

Yr.	Westf. Nuss gew. Korn 1 u 2*	Sunderland Nuss. **	West Hartley steam. **	Westf. Nuss minus Railway rate = 5.60 *	Price Norm Fett Nuss II *	Difference
	m.	*m.*	*m.*	*m.*	*m.*	*m.*
1890	19.1	18.6	18.3	13.50	----	----
1891	18.8	17.9	17.1	13.20	----	----
1892	17.7	15.7	15.1	12.10	----	----
1893	16.7	16.3	15.2	11.10	10.00	1.10
1894	16.4	14.9	15.1	10.80	10.50	.30
1895	15.8	13.9	13.4	10.20	11.00	—.80
1896	15.8	13.2	12.7	10.20	11.00	—.80
1897	16.8	13.7	13.1	11.20	11.00	.20
1898	17.3	14.4	14.6	11.70	11.00	.70
1899	18.0	15.6	15.9	12.40	11.50	.90
1900	24.2†	22.7	22.4	18.60	12.75	5.85
1901	20.4†	18.6	17.4	14.80	12.75**	2.05
1902	19.3†	18.2	16.7	13.70	12.50**	1.20

* *Vierteljahrsh.*, 1900, I, p. 18. * Denkschrift, p. 21.
† " 1903, I, p. 21. ** Enquete, p. 282.
** " 1902, I, p. 21. The column of differences has no exact value.

demand of 1899, the prices were put up above the normal prices of the undisputed territory, an advance of an extraordinary character being made in the following year (1900) when it was found impossible to supply the demands of the home market.

In the following table, we have the average wholesale Berlin prices from 1887 to 1899 for three sorts of coal. From the Berlin price of the Silesian coals the average cost of transportation is subtracted, and a comparison made of the differences with the average mine price. The costs of transportation subtracted are averages of all rail and rail-and-water charges given by Sympher[1] for Upper Silesia (Königshütte) and the Waldenburg district (Dittersbach); the average is taken rather than the cheaper rail-and-water alone, because navigation is interrupted for a good part of the year.

[1] Sympher, p. 136.
Upper Silesia, all rail 10.52 m. Lower Silesia, all rail 7.39 m.
rail and water 8.55 m. rail and water 6.45 m.

	Berlin ab waggon*			Oberschl. Gas			Niederschl. Gas		
	Westfäl. Gas	Oberschl Gas	Niedersch. Gas	Berlin price minus frt. =9.54	Mine price**	Difference	Berlin price minus frt. =6.92	Mine price**	Difference
	m	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
1887	16.9	18.3	17.1	8.76	5.9	1.86	10.18	9.9	.28
1888	17.6	18.3	17.2	8 76	5.9	2.86	10.28	9.8	.48
1889	21.1	19.2	18.7	9.66	7.0	2.66	11.78	10.9	.88
1890	24.0	20.3	22.1	10.76	9.5	1.26	15.18	13.4	1.78
1891	23.5	20.3	21.3	10.76	9.2	1.56	14.38	12.8	1.58
1892	21.3	20.3	20.3	10.76	9.1	1.66	13.38	12.7	.38
1893	20.7	20.6	20.0	11 06	9.0	2.06	13.08	12.6	.48
1894	20.8	20.0	20.0	10.46	9.0	1.46	13.08	12.6	.48
1895	20.8	19.6	20.0	10.06	9.0	1.06	13,08	12.6	.48
1896	20.6	19 2	20.0	9.66	8.9	.76	13.08	12.6	,48
1897	20.7	18.5	19.8	8.96	8.7	.26	12.88	12.8	.08
1898	21.3	18.8	20.2	9.26	9.1	.16	13.28	13.1	.18
1899	22.3	19.2	21.2	9.66	9.8	—.14	14.18	13.7	.48

* *Vierteljahrsheft*, 1900, I, p. 18.

** *Ib.*, 1903, I, p. 21. The differences have no exact value.

An inspection of the second part of the table shows in the columns of differences a greater average margin (between mine price and Berlin price) for Upper than for Lower Silesia, which disappears in the last two years. In the last year (1899) Berlin got her Upper Silesian coal (according to this calculation) cheaper than purchasers in the neighborhood of the mines.[1]

Through these competitive German markets, in Hamburg, Berlin, etc., the price of English coal comes to have a perceptible effect on the general price policy of the syndicate. Thus in 1899, the report of the syndicate complains that the advance in English prices (due to the war in South Africa) had a disturbing effect on the general market.[2] Similarly the English export tax

[1] In 1902 Upper Silesian Gas and Stück sold in Berlin (at R. R.) at 22.04 m., and the mine price was 11.70 m.; subtracting the assumed freight charges (9.54 m.) we have for Berlin 12.50 m., or .80 m. over the mine price. *Cf. Viertelj.*, 1902, I, p. 15.

[2] Bericht d. Rhein-Westf. Kohlen Synd., 1899, quoted in *Essen Hk.*, 1899, II, p. 6.

on coal was claimed to have an effect on the German market ;[1] Calwer thinks it really hindered competition.[2] It is true that English importations in Hamburg declined in 1901 as compared with 1900, but 1900 was an extraordinary year. The Chancellor of the Exchequer recently pointed out in Parliament that English exports had increased since 1900, and the price for export had risen more than the shilling tax.[3]

In the sale of coke in the Minette district, there existed formerly specially favorable prices, less, that is, than the price norms in the undisputed territory.[4] This lasted, it seems until about 1899. The reason is, obvious enough. In the Minette district five coal producing regions compete, viz., the Ruhr, the Saar, the Wurm, Belgium and France. The principal competitors of the Ruhr are the last two. With the Belgian and the Wurm districts, deals were made in 1894 by which the field was divided.[5] The partial removal of competition resulted in an improvement in prices which is specially noted as a consequence in two consecutive reports of the coke syndicate.[6] At the same time the French competition in the region, favored by lower freight rates, became sharper.[7]

[1] Bericht d. Rh.-Westf. Kohlen Synd., 1901, p. 13.

[2] Calwer, 1901, p. 104; *cf.* also Enquete, p. 362.

[3] *Industrie Ztg.*, 3 July, 1903, p. 275; *cf. Ber. d. Aeltesten*, 1901, p. 16; it is said that the tax had no effect on competition.

[4] Enquete, pp. 633–4.

[5] de Leener: Les Syndicats Industriels en Belgique, p. 230; Enquete, pp. 625–6, 632.

[6] Reports of 1894 and 1895, in *Bochum Hk.*, 1894, p. 11; 1895, p. 9.

[7] Report of coke syndicate, 1895, in *Bochum Hk.*, 1895, p. 9.

CHAPTER V

EXPORT PRICES AND EXPORT BOUNTIES.

The markets for German coal extend beyond the borders of the country, and for all the important export markets, these prices also are competitive.[1] The most important foreign competitive markets are Holland, Belgium, France, Austria and Switzerland. (*Cf.* p. 20.) For Holland and France, the Ruhr and the Saar, respectively, get the business. The export to Russia and Austria is from Upper Silesia. The export to Switzerland is mostly from the Saar.[2]

So far as the Upper Silesian export prices to Austria are concerned, any reduction below the minima prices of the convention has been categorically denied by General Director Bernhardi. He states that, on the contrary, for the export during the strike in Bohemia higher prices were demanded by Upper Silesian mines.[3] Nevertheless, according to Herr Williger's statement, the export to Russia was favored by a lower minimum price, which was claimed to be justified by the high duty levied on coal by that county.[4] This duty is between two and three marks.[5] Coal shipped at lower than the minima prices to the Baltic coast finds an easier export on that account.

In the export policy of the two Ruhr syndicates, we have the cause of the most violent attacks upon them. The encouragement and development of the export

[1] Enquete, p. 78.

[2] *Zt. B. H. u. S.*, 1902, p. 100 (532,125 tons.)

[3] Enquete, p. 347.

[4] *Ib.* p. 357.

[5] Friedrich, p. 49.

trade in coal was one of the earliest reasons for association among the mining interests (see p. 40), and, indeed, success in promoting it was held to be a very praiseworthy act. In the period when the mines were paying assessments, rather than earning dividends, and coal was very cheap, the coal exporter got all the praise he claimed. But even then the export had to be developed, as it is said, "by sacrifices", that is, by selling at a price (transportation deducted) below the local market.

The earlier objection to low export prices, particularly *export prices below average cost of production*, was that it raised the price at home, because, in order to get a fair profit on the whole, the domestic consumer had to pay enough to cover the difference between the export price and an average paying price. That this is by no means a necessary or even presumptive consequence, and that, on the contrary, low export prices may, by increasing the volume of sale, enable the producer to produce more cheaply, and so to sell more cheaply at home also, although not as cheaply as abroad, was argued from the early days of the export trade by the coal and iron interests.[1]

The argument against low export prices has taken recently a different form. They are held to be against the general welfare on the ground that they give the foreign producers of competing lines of goods, for which the exported article is a material of manufacture, an unfair advantage, and thus enable them to compete, to the injury of the national manufacturer, either in their respective domestic markets or in some

[1] Abgeord., 1903, pp. 1538-9; *Bochum Hk.*, 1886, p. 16; *cf.* Lotz, p. 18.

common export market.[1] When a cheap export price is made, it is generally because that it is the world market price, or because some special obstacle, such as a customs duty or railroad rate, must be neutralized. In most cases, the foreign competitor would get the commodity just as cheap whether the particular country in question was exporting below the domestic market price or not. Liefmann argues, therefore, that the real cause for complaint is not cheap export prices, but high domestic prices.[2] This is, indeed, in the main correct. But it must be recognized, also, that the increased supply made by the offers of *one* country may depress the price in the competitive market immensely. Again, there may be only two important competitors in the export market; the withdrawal of one as a cheap exporter would perhaps lead to a monopoly of the other, in which case the price would presumably rise, so that the industrial consumers of that country would no longer enjoy exceptional advantages in the price of the material in question. These suppositions are peculiarly applicable to international coal markets. Within certain limits of price, especially in localities removed from water communication, competition is limited at the best. One more general point may be made. The exportation of a greater or lesser quantity of coal has nothing to do with the local supply, and exportation is not designed to produce a scarcity in the local market.[3]

[1] *Cf.* Resolution of Abg. Oeser, Feb. 17, 1903, demanding the abolition of the customs duty on raw products, where price discriminations are made, in order that producers for export may compete successfully in the world market. Abgeordnetenhaus, 1903, Feb. 17, pp. 1506–7.

[2] Liefmann: Schutzzoll u. Kartelle, chap. II.

[3] Prof. Lotz cites from A. Smith a case of a combination of merchants to export a large quantity of a commodity over which they disposed, in order to enjoy the high prices attained by the remainder (p. 16). Some people to-day think the coal exports have the same purpose, but such a policy would be senseless where they control the production, unless the export was in itself advantageous.

A satisfactory determination of this much disputed question of cheap exports would require a much greater amount of information in regard to the facts, at least in the case of coal, than is accessible. The question is a question of values, and hence a quantitative question. We should need to know not only the domestic and foreign prices, but also the amounts purchased and their importance in respect to cost of production for the manufactures under consideration; further, the markets in which the manufactured goods were offered, the quantities offered by different competitors, etc., etc. Such data evidently are not easily to be obtained, but a few facts are available which throw some light on the subject. The export of coal for 1902 was:[1]

	Germany.	*Ruhr Synd.*
To Belgium	2,217,419 tons.	1,778,680 tons.
To Holland	4,540,955 "	4,163,156 "
To France	980,967 "	440,335 "

These are the only industrial countries to which the northwestern coal districts export much. A part of the French shipments comes from the Saar, the rest chiefly from the Ruhr. It is known that a considerable portion of the Dutch and Belgian importations are for the steamship lines.[2] A part, undoubtedly, enters into the production of wares which compete with German manufactures. The export to France is mostly industrial. In 1897, the German importations are given as 2,076,600 tons, of which 1,720,100 tons were to the industrial department Meurthe et Moselle. The whole importation was only 5.6 per cent. of the French consumption; but the German coal in the department Meurthe et Moselle constituted 43 per cent. of the consumption of that district. The Belgian importation for

[1] See pp. 20-21, *supra*.

[2] Reichstag, 1900, p. 284.

the same department was 804,000 tons, or 20 per cent. of the consumption.[1] However weighty the German product was in 1897, it has evidently gone back very much since then, and is less than half of what it was, while the complaints about exports have progressed inversely. When we consider the subordinate character that the German coal plays there to-day, it seems very unlikely that it would try to dictate the price, especially when we consider also that it must encounter a customs duty of 1.20 frcs. per ton, and that only half of it comes from an organization capable of pursuing a very aggressive policy. Further, we have the fact that the proceeds per ton for exports in 1902 were 9.84 m. as compared with 10.45 m. for domestic sales; in 1900, the figures given are 9.82 m. and 10.70 m. respectively, but in 1901 the export proceeds are said to have been higher, viz. 11.22 m., against 11.01 m. for domestic.[2] In respect to the higher export price in the French Minette, confirming testimony comes from a French source. It is said that in 1900 the price of German coal sold in France was raised 2.50 fcs. above the domestic German price. In consequence, the proposition was made in the Chamber of Deputies to remove the customs duty, but this was successfully opposed by the argument that, if the duty were repealed, the Germans would raise the price by the same amount, because they

[1] *Comité Central des Houillères de France*, 1899, Pl. I.

[2] Enquete, p. 280. It must be admitted that these figures are subject to some question. On p. 279 the average proceeds per ton of the syndicate for total quantity shipped are stated as 11.01 m., and the average proceeds for exports at 11.22 m. These figures are not reconcilable, a considerable export having been made. It is probably a typographical error.

did not need the market and had only to meet the price of the mines of Nord and Pas de Calais.[1]

In Belgium, the coal production is divided up among a number of cartells in the different districts or "bassins." For the coal contracts with the state railways, they meet at Charleroi, and determine the prices and pool the orders. According to de Leener, these prices during a *hausse* are made lower than the ordinary market prices on account of their publicity and for the social effect. These prices, says de Leener, guide the whole industrial coal market, which is completely under the influence of the pool.[2] Under these circumstances, it does not seem likely that the Ruhr syndicate has done much to injure German manufactures by low export prices. During the recent *hochconjunktur*, it is confessed that very high prices were obtained.[3] In Holland, on the other hand, it seems that the syndicate has had to go further;[4] but it does not appear that the German coal importation in Holland is a dominant price-making factor.

A rather sensational story is told by Sayous (on the authority of the *Kölnische Volks-Zeitung*) concerning the sale in 1902 of a lot of 60,000 tons of coking coal,

[1] Ceci est tellement vrai, a dit le rapporteur de la commission, que nous voyons les Allemands majorer de 2 marks leurs prix pour les exportations en France; ils nous vendent 16 marks, soit 20 francs, ce qu'ils cédent à 17 fr. 50 à leurs nationaux; avèc le droit de douane ils arrivent en Meurthe-et-Moselle aux mêmes prix que les charbons du Nord et du Pas-de-Calais; si l'on enlevait le droit de douane, ils augmenteraient leurs prix de 2 à 3 marks, et cela, bien entendu, parce qu'ils ne tiennent pas à exporter, mais au contraire à conserver leur charbon pour leur industrie.

Perquel: La crise du charbon en Allemagne. Paris, 1900, p. 22.

[2] de Leener, p. 227.

[3] Enquete, p. 75.

[4] Abgeord., 17 Feb., 1903, p. 1519.

"at a distance," for 2.00 marks. He says, also, that various sorts of coal are exported, and, disguised by different names, are sold more cheaply than at home.[1]

It is alleged that the fiscus pursues the same policy in exports as the private coal producers;[2] and the exaction of higher export prices by the Upper Silesian fiscus in 1899 is mentioned as a matter of special merit.[3]

There has been quite as much complaint about the cheap export of coke as of coal. The total export of coke in 1902 was 2,182,383 tons;[4] most of this came from the coke syndicate, viz., 1,611,979 tons;[5] the greater part of the remainder was from Upper Silesia. The exports of the Ruhr syndicate were,[6]

France	710,870 tons.
Belgium	153,947 "
Holland	47,778 "
Switzerland	100,305 "
Austria	186,405 "
Russia	75,612 "

Belgium is cartelled with the Ruhr, hence there can scarcely be much injury to German industry there. The export to Holland is too small to be worth considering, and not enough to be decisive as to the price. For practical purposes, it comes down to a question of France and Austria. A story published in the *Frankfurter Zeitung* about a price of 8.10 m. for coke sales in Austria has gone the rounds, and has been cited as an example and proof of the pernicious influence of the coke cartell.[7] Apart from the peculiari-

[1] Sayous, p. 273.

[2] Reichstag, 1902, p. 6100.

[3] *Ib.* 1900, p. 374.

[4] *Monatl. Nachweis u. d. Auswärtige Handel*, Dez. 1902, p. 192.

[5] Enquete, p. 622.

[6] *Cf. supra, p. 23.*

[7] Enquete, p. 643; Abgeord., 1902, p. 6116; Raffalovich, p. 200.

ties of this individual contrast, the defenders of the coke syndicate excused the low price given on account of the high transportation charges which their Bohemian customers had to pay, charges which really left the Bohemian producer at a disadvantage in competition with those works situated near the coal region.[1] The opposition probably came quite as much from Lower Silesian coke interests as from German manufacturers threatened by Austrian competition.[2] Respecting low prices in other countries, there is little information.

Reference is made to prices of 11.00–12.50 marks for Belgium and France, when the normal price was 15 marks.[3] Sayous repeats a story of the inveterate antagonist of the cartells, the *Kölnische Volkszeitung*, to the effect that enormous shipments of coke were being sent to northern France in 1902 at a price near the cost of production.[4] It seems very doubtful if such a shipment affected German industry in any way; still less could a sale to Malaga (Spain), no matter how cheap the price. The story here is that the coke was delivered at 21 shillings.[5] These tales are repeated only as examples of what is given out for popular consumption. Cheap export is not an extraordinary measure; on the contrary, it may be regarded as the normal condition of highly developed industries in periods of depression; on the other hand, in boom periods export prices are often high.[6]

[1] Enquete, pp. 645–6, 650; *cf.* Sayous, p. 282; *Bochum Hk.*, 1892, pp. 7–8.

[2] Enquete, p. 652.

[3] Raffalovich, p. 18; Abgeord., 1902, p. 6116.

[4] Sayous, p. 283.

[5] *Id.*, p. 282; he reckons transportation to Malaga at 10–10.50 marks.

[6] Kirdorf, Enquete, p. 75.

The only real evidence concerning the significance of the export rebates are, first, the proceeds, domestic and foreign, and, second, the "Umlage". In respect to proceeds, unfortunately, the material is very insufficient, covering only three years. These years, however, are of special interest, because they include the *hausse* of 1900 and the depression of 1902. For coal, they were:[1]

Year.	*Domestic, aver. proceeds.*	*Exports, aver. proceeds.*
1900	10.70 m.	9.82 m.
1901	11.01 "	11.22 "
1902	10.45 "	9.84 "

The rise in the domestic price in 1901 is presumably to be explained by the fact that in the internal "disputed territories" smaller concessions were made; on the other hand, the low price for exports in 1900 may be explained by the fact that most of the exports were sold by previous contract. The prices for 1902 show the situation in a year when the syndicate was fiercely blamed for its export policy. The exaggerated accusations of its opponents fall rather flat before this showing, and its correctness has not been impeached. Corresponding data are provided for the export receipts of the coke syndicate; a slight dissimilarity should be noted, namely, that the average proceeds from export are given for all kinds of coke, while the internal price (not proceeds) is given and for blast furnace coke only, (though this is about 80 per cent. of the total). The total average selling price per ton is also given.[2]

Year.	*Domestic, aver. price to Blast Furnaces,*	*Export, aver. proceeds per ton.*	*Total Sales, av. selling price per ton.*
1900	17.00 m.	16.12 m.	16.70 m.
1901	17.00 "	16.86 "	18.00 "
1902	15.00 "	13.11 "	15.34 "

[1] Enquete, p. 280.

[2] Enquete, pp. 649, 668, 792.

The second column contains simply normal prices for the principal sort of coke; the most valuable parts of the table are the third and fourth columns. The export proceeds run lower, in every case, than the domestic average price for blast furnace coke, which, when the height of the *hausse* is considered, is rather surprising. Perhaps the relatively low receipts for export of 16.12 m. were due to the existence of contracts made previously to the development of the demand. Much more information is required as to the facts before any very confident conclusions could be drawn, but, as far as the data show, there was not discrimination enough in the export prices to be very dangerous to German industry.[1] Individual cases of a character injurious to German industry have undoubtedly occurred,—the low prices in Austria for coke may be fairly classed as such; but this does not involve the condemnation of the whole system. Further, it may be said that these sporadic low prices often do almost as much harm to the foreign competitor as they do good to the foreign customer, so that from an international competitive standpoint the disadvantage is not all on one side.[2]

Perhaps after all the best argument against the extreme views[3] as to the injury caused to home production

[1] In respect to the comparison of proceeds, it should be stated that to estimate the real difference between domestic export prices, we should know more about the quality of coal in each case. It is probably true that the export represents a higher average quality. Hence a lower rate of average proceeds would mean a greater discrimination against the domestic consumer than appears. *Cf.* Enquete, p. 94.

[2] *Cf.* Raffalovich, p. 65. Cet état de choses anormal, très nuisible aux industries allemandes de transformation, est funeste aussi aux concurrents de l'allemagne, car il equivaut a la désorganisation du marché.

[3] *Cf.* Huber, p. 144.

by these low export prices is the plain fact that the market prices abroad are in general quite as high or higher. It is absurd to suppose that the syndicates take less than they can get. *Very low* export prices therefore are abnormal, and are made to get rid of stock. In order to keep the production going on a steady basis, this must be done from time to time, because the demand cannot be figured exactly. The domestic price might be reduced, but this latter course seems impolitic to the syndicates, not only from the point of view of their own profits, but also from that of their regular customers who have contracted to pay schedule prices.

Herr Bernstein, the celebrated leader of the socialists, has denounced this practice as treason,[1] and it has been condemned by many critics of cartell policy;[2] on the other hand, some have justified it within certain limits.[3] As Steinmann-Bucher has observed, such a policy tends to promote the development of international cartells.[4]

The complaints from iron and textile interests, in 1891, on account of the low export prices of the Ruhr syndicates, led to an official investigation by the Prussian government. To the claim of the syndicates that their price policy was their own private business, the minister of commerce and industry replied that it was the duty of the state to promote the economic welfare

[1] Reichstag, 1902, p. 6092.

[2] *E.g.*, Kuhlo, pp. 14–16; Oeser, p. 14; Juliusberg, p. 22; Bücher, *Ver. f. Soc. Pol.*, p. 148; Francke, *Zeitschr. Preuss. Stat. Bureau*, 1903, p. 8; Naumann, *Nat. Soz. Verein*, 1902, p. 77.

[3] *E.g.*, Liefmann, Unternehmerverbände, pp. 164–5; Brentano, *Ver. f. S. Pol.*, p. 182; Franz, p. 7; Ste nmann-Bucher, Wesen, etc., p. 177; Urban, p. 18.

[4] Steinmann-Bucher, Wesen, etc., p. 179.

of the people, and in doing so, it would use the means at its disposal, whether in the allowance of favorable railroad tariffs, or in the withdrawal of the same.[1] The coal people seem to have seen the point, and, since then, have adopted the safer arguments of practical expediency. On the other hand, the government refuses to-day to interfere in such cases;[2] and they could hardly make such a complaint with self-respect, since their own practices in that direction are extensive.

The high cost of raw materials in Germany makes it necessary for the German manufacturers to charge a high price in the local market; even if it is not necessary, they generally do, protected, as they are, from foreign competition by customs duties, and from internal competition by cartells. In the world market, on the other hand, they must meet a different situation—a competitive price and a price that is sometimes below the cost of production even of the most favored producers. If the domestic market is strong enough to accept large quantities at high prices, they can increase their profits by exports, even if they must sell below cost; if, however, the home market is not strong, especially if the demand is weak, and at the same time the cartell organizations do not exist, or are not strong enough to maintain prices, then export becomes a precarious resource, and may be carried on at a heavy loss simply to keep the works employed.

Under such circumstances, the pressure on the raw material cartells to reduce their prices is naturally very heavy, but they are loath to reduce prices for these ail-

[1] *Bochum Hk.*, 1901, p. 9; *J.-B. Verein Dortmund*, 1890, p. 112. The complaints cited a case of coal sales to Rotterdam at 117 marks and to Coblentz at 150 marks per 10 tons.

[2] *Cf.* Reichstag, 1903, pp. 1515–16.

ing industrial branches, because that practically carries with it reductions for an immense amount going in other directions.[1] One obvious way to evade the difficulty would be to offer special rebates ; a more flexible system, however, is that of export bounties or premiums to the consuming industries.[2] It appears that as early as 1882 the raw iron interests of Westphalia and Siegerland gave price rebates to certain groups of rolling mills.[3] For the coke syndicate, this policy appears to date from 1892.[4] The report of the coke syndicate for 1892 states that a bounty of 1.50 m. per ton export of raw iron was granted to the Siegen blast furnaces and to the Roheisenverband.[5] This was kept up in 1894[6]; in 1895, the bounties are stated to have been 1.50 m. for raw iron and 2 m. for Spiegeleisen.[7]

Information respecting the coal export premiums is less precise. Raffalovich[8] speaks of bounties in the mining and metallurgical industries, beginning in 1891, which were paid by the coal, iron and Halbzeug cartells. This bounty was normally 15 marks. It was modified further in two ways, first, by the limitation of the total amount payable, and second, by differentials according to geographical situation. One purpose alleged for its continuation during the prosperous years 1895–1899 was the desire to retain for the bounty paying cartells the exclusive custom of the beneficiaries of

[1] Enquete, p. 178.

[2] Hirsch, *Cent. Verb. D. I.*, 1901, p. 212.

[3] Liefmann, Unternehmerver-bände, p. 166.

[4] Liefmann, Schutzzoll, p. 31.

[5] Rept. coke syndicate in *Bochum Hk.*, 1891, p. 9.

[6] Rept. coke synd., *Ib.*, 1894, p. 11.

[7] *Ib.* 1895, p. 9.

[8] Raffalovich, p. 23.

the same.[1] In 1896 the coal interests refused a bounty to wire, on the ground that wire manufacturers should direct their claims rather to the raw iron interests, because raw iron was a more important material for them than coal.[2] It seems to have been granted to them willingly a little later, and then suddenly withdrawn about 1898 or 1899, on the ground that the raw iron people were putting up prices so rapidly that the iron industry must be considered capable of taking care of itself.[3] In 1901, the export bounty system was put in full blast again[4]; the exclusive customers of the coal and Halbzeug cartells were allowed 15 m. per ton of exports, on a contingent of 33⅓% of the total output of the Halbzeugverband. Of this bounty 5 m. was paid by the coal syndicate.[5] It appears that outside of this, the coal syndicate allowed to iron exporters (who were exclusive customers) an export bounty of 2 m. per ton.[6] The export premium stimulated the sale of raw iron in 1901, though the production was very heavily contracted; rolled iron also was exported with energy but the rolling mills complained of the exportation of Halbzeug at cheap prices, which gave their foreign rivals an undue advantage.[7]

In 1902 the system was reorganized on a more elaborate scale. On February 1, 1902, a meeting was

[1] Liefmann places the beginning of these coal premiums in 1893. Schutzzoll u. Kartelle, p. 31.

[2] *Id*, p. 165.

[3] Enquete, p. 163. Among the standing committees of the coal syndicate in 1899, one was on export bounties; *cf. Industrie Ztg.*, 1899, p. 46.

[4] Bericht d. Rh. Westf. Kohl. Synd., 1901, p. 13.

[5] *Düsseldorf Hk.*, 1901, p. 14.

[6] Wieser, p. 307.

[7] *Bochum Hk.*, 1901, pp. 107-12; *cf.* Enquete, vol. VI, *passim*.

held at Cologne of leaders of the coal and iron interests to consider the organization and policy of export bounties. Herr Kirdorf proposed an arrangement between the following syndicates, namely coal, coke, the three raw iron cartells of the west (viz., Westphalia, Luxemburg and Siegen) the Halbzeugverband, the Trägerverband and the wire and plate cartells. The coal, raw iron and Halbzeug were to pay the bounties in certain fixed sums, and proportions; the payments of the coal cartell to be made to the raw iron, and the raw iron to add the same to its own contribution and pay to the Halbzeug cartell which should pay directly to the exporter. This indirect system was to be established to secure for each syndicate some control over the other, because the fundamental principle of the arrangement was that the products of the combined cartells should be used exclusively in the manufacture of the subventioned exports. Control over the whole operation was to be secured further by a bureau to be established in Düsseldorf, which was called the export accounting office (Abrechnungsstelle für die Ausfuhr). This office was to be entrusted to two agents who were to execute the determinations of a council of supervision (Aufsichtsrat) in which the coal, coke, Düsseldorf and Luxemburg raw iron and the Halbzeug and beam cartells should have representatives. The expenses of the office were to be covered by a 1% tax on the bounties paid. This council of supervision was to decide the amount and duration of the bounties and to adjudge disputes.[1] According to the Düsseldorf chamber of commerce, the

[1] *Industrie Ztg.*, 14 Mar. 1902, p. 90. Raffalovich, pp. 24–5.

bounties actually allowed for the fourth quarter of 1902 were as follows :[1]

1.50 m.	per ton	for	coal.
2.50 "	"	"	raw iron (excl. coal bounty).
10.00 "	"	"	Halbzeug (incl. coal and iron bounty).

These were continued during the year 1903.[2] This system requires that the executive officers of the Abrechnungsstelle may have a sight of the books and papers of the concerns claiming the payment of export bounties, a condition that not unnaturally was extremely disagreeable to the claimants.[3] Some of the rolling mills receiving bounties thought they ought to have a seat and voice in the council of supervision.[4]

As a basis for the allowance of bounties, a table was constructed giving the estimated quantity of material required in the successive stages of manufacture.[5]

Coal consumption.	*Tons.*
Per ton Bessemer ingots	.150
" Siemens-Martin ingots	.350
" blooms and billets	.550
" rails, beams, etc	.600
" rods (from billets)	.500
" drawn wire, wire nails (from billets)	.800
" bar iron, angle iron, etc. (from billets)	.350
" plates	.700

[1] *Düsseldorf Hk.*, 1902, p. 34.

[2] *Kartell-Rundschau*, pp. 48, 819 ; *Industrie Ztg.*, 1902, 12 Dec., p. 553. It is currently reported that, since the formation of the new Stahlwerksverband, 1904, the export bounties have been allowed to that cartell exclusively.

[3] Herr Abg. Dr. Müller said in the Abgeordnetenhaus—" Das Rundschreiben des Syndikats redet ja in dieser Beziehung eine nur allzudeutliche Sprache, die jeden Zweifel ausschliesst über die Stellung, die der Verband im Verkehr mit "seiner" Kundschaft sich anmasst. Das ist nicht der Ton, den gleichberechtigte Interressenten zu einander anschlagen. So spricht der Vorgesetzte zu seinen Untergebenen, so spricht der Despot zu seinen Sklaven, (sehr wahr ! links), so spricht der Feudalherr zu seinen Hörigen," etc. Reichstag 1902, p. 6146.

[4] Enquete p. 173.

[5] Raffalovich, pp. 25–6.

Coke consumption.	
Per ton iron	1.100
" ingots	1.300
" half-products, rails, girders, etc	1.350
" bar iron, rods	1.400
" drawn wire	1.500
Iron consumption.	
Per ton ingots	1.150
" half-products, rails	1.200[1]
" bar iron	1.250
Half-products consumption.	
Per ton rods	1.060
" bar iron, plates	1.100
Rods consumption.	
Per ton wire, nails	1.100

How these tables are practically applied can only be conjectured. It would seem that the exporter of raw iron should receive on account of coal and coke; (1 t. coke equals 1.43 t. coal) about 2.35 m. per ton iron; the exporter of rails about 6.80 m. per ton of rails; the exporter of rods, 13.33 m. per ton of rods.

The large "mixed" works complained that the grant of export bounties to the "pure" rolling mills injured the export market by depressing prices.[2] The rolling mills, on the other hand, claimed that they had to meet the competition abroad of rolling mills using German half-products obtained at cheap export prices.[3] Under such circumstances, it does not seem difficult to believe that the actual export bounties are not an equivalent.[4] The situation in respect to fuel seems to have a more equal aspect. It is said, for example, that coke was sold in Germany for 17.50 m., and abroad (Belgium, Luxemburg and France) at 12.50[5]; this is a difference

[1] 4.200 in original.
[2] Enquete, pp. 178–9.
[3] Raffalovich, pp. 27–8; Abgeord., 1903, pp. 1525–6.
[4] *Id.*, 1903, p. 1526.
[5] *Ib.* p. 6116.

of five marks. From this the duty, 1.20 francs, would be deducted. The bounty for coke consumed appears to be 2.15 m. per ton coke. In the case of coke, however, the freight plays an important *rôle* in handicapping the foreign purchaser, and even an advantage of 2.85 m. in coke would not seem to give the manufacturer of raw iron in the French Minette any advantage over one in Westphalia[1] or Siegerland—quite the reverse. In saying this, no advocacy of the general system is intended, which is almost, if not quite, as Rousiers says, "*dans toute sa beauté, le régime du sucre;*"[2] the point of the above statement is simply this, an injury to certain German industries in this respect seems to be alleged rather than proven. Even if we agree with Prof. Lotz that the price policy of the coal and coke syndicates makes the protection of the iron industry a necessity, it would not be on the ground of the export policy as hitherto practiced.[3] The important question for them, as for the public, is the internal price policy.

The bounty system is essentially a part of the price system—a form of rebate; these rebates, together with the low export prices and the low prices in the competitive regions, form a source of liability for the syndicate which must account for the sale of the coal of its members at fixed prices. Principally to cover these liabilities the syndicate must levy a general tax on the proceeds of the sale. This is called the 'Umlage.' The Umlage is particularly interesting as it affords a gauge of the magnitude of these expenses, but we can-

[1] For the German Minette, not only the French duty, but also competitive prices should be taken into account.

[2] Rousiers, p. 177.

[3] *Cf.* Lotz, p. 25.

not take the gross sum of the Umlage, because a part of it is levied to cover other administrative expenditures. As the necessary data are not available for the whole term, the statistics for the coal syndicate present a very incomplete appearance; for the coke syndicate only the Umlage itself in per cent. and total is obtainable. The first report of the coal syndicate gave the total Umlage and also the amount paid in compensation. The latter shows approximately what the cut from the regular prices was in the competitive regions, *domestic* and *foreign* (minus any possible excess proceeds).[1] The difference between the Umlage and the compensation gives the amount available for administration, *etc.*, and also for bounty payments.[2] The available data may be tabulated as follows:[3]

(1) Year.	(2) Total proceeds Syndicate Sales.	(3) Umlage %	(4) Amount of Umlage.	(5) Compensation.	(6) Difference
1893	----	----	912,143	643,799	268,344
1894	124,541,419	----	----	----	----
1895	195,955,623	----	----	----	----
1896	222,270,410	8.50	18,892,985	----	----
1897	254,670,742	8.25	21,010,336	18,755,041	2,255,295
1898	277,069,403	8.75	23,243,476	----	----
1899	311,598,473	6.88	21,457,942	----	----
1900	384,666,476	3.88	14,925,059	11,820,350	3,104,710
1901	396,049,892	6.00	23,762,994	20 920,764	2,842,230
1902	361,121,321	6.00	21,667,279	20,001,111	1,666,169

[1] *Cf.* Enquete, p. 72. These were realized in some years.

[2] Dr. Vogelstein is the only writer noticed who has made any attempt to get at these facts, which he finds directly from the syndicate report of 1893, and estimates for 1897.

[3] Column (2) from Enquete, p. 279. Column (3) from *Dortmunder Jahrbuch*, 1901, p. [illegible], except 1901, 1902, from Berichte d. Kohlen Syndicats. Columns (4), 1893 from Vogelstein, p. 76, rest from (2) and (3). Column (5), 1893 from Vogelstein, rest reckoned from (4) and (6). Column (6), 1893 and 1897 from Vogelstein, rest from Berichte d. Kohlen Syndicats.

It is evident that the amount paid out for compensation (for cuts below the standard prices) greatly exceeded the total export bounties, whatever they may have amounted to, figured per ton of coal, but it must be remembered that these include domestic as well as foreign sales, and not only the low prices of the competitive domestic territory, but also for other sales, *e. g.*, state railways.

The data for the coke syndicate are even more meagre. In the following table only the total Umlage is reckoned because the differences are not known.[1]

(1) Year.	(2) Tons sold.	(3) Average proceeds.	(4) Calculated total proceeds.	(5) Umlage. %	(6) Calculated total Umlage.
1891	2,855,000	12.85	36,686,750	5.25	3,081,508
1892	4,025,053	10.46	42,102,054	14.44	6,079,536
1893	4,196,917	8.73	36,639.085	21.98	8,053,270
1894	4,736,195	8.44	39,973,486	22.75	9,093,968
1895	4,821,787	9.05	43,637,172	18.00	7,854,690
1896	5,574,695	9.81	55,087,758	15.00	8,353,164
1897	6,041,119	10.76	65,002,440	13.50	8,775,329
1898	6,415,683	12.79	80,056,646	9.10	7,285,156
1899	7,045,923	13.19	92,935,724	7.33	6,812,189
1900	7,786,347	16.70	130,031,995	4.50	5,851,440
1901	6,833,567	18.00	123,004,206	2.75	3,382,616
1902	6,873,162	15.34	105,434,305	4.08	4,301,720

There are no export bounties in Upper Silesia, the

[1] (2) Sale and production are given as equivalent in the coke syndicate; *Cf.* Bericht, 1902, p. 4, etc., except in 1891 when the syndicate sold 2,855,000 tons out of a production of 3,937,773 tons; *Cf.* Report of 1891 in *Bochum Hk.*, 1891, p. 11; 1897 is calculated from 1898 from percentage increase of same. (3) *Dortmunder Jahrbuch*, 1901, p. 558; except last 3, for which see Enquete, p. 792 (the figures are proceeds rather than prices). (4) Product of (2) and (3). (5) The first five are approximations estimated from a statistical diagram in Bericht d. Cokssyndicats, 1900, Appendix; the rest are specifically given in *Dortmunder Jahrbuch*, 1901, p. 561, except the last two which are from Berichte d. Cokssyndicats, 1901 and 1902. (6) Product of (4) and (5).

character of the organization precluding any such policy.[1]

It is very easy to criticize and condemn export bounties, and few probably would be found who regard them as wholly satisfactory. It is certainly possible, however, to show cases, especially for manufactures, where the bounty policy is in itself capable of promoting national interests,[2] but the present discussion has to do with a concrete and practical situation which furnishes more evident justification for such a policy. When other countries are exporting at prices based on a bounty system, the individual country may be often compelled to imitate them to save great losses. In the sugar industry, these bounties were paid by the governments of the producing regions, and the only way to do away with the system was to make an international treaty for their abolition and to provide for the establishment of penalty custom taxes on the sugar imports of countries refusing to do the same.[3] Even those who opposed the system recognized the wisdom of abolishing it in this way.[4] The Russian Finance-Minister de Witte, though refusing to give Russia's consent to this agreement, has favored a larger scheme, which should include other products, as well as sugar, and

[1] Enquete, pp. 467–8.

[2] *Cf.* Edgeworth, *Econ. Jour.* IV, 48.

[3] Brussells Convention, art. 3.

[4] Germany tried to go alone before, and had to give it up. In a speech in the Reichstag Graf Posadowsky said: "Wir sind mit dem Gesetz von 1891 die Prämientreppe hinuntergegangen in der Hoffnung, dass unsere Konkurrenten uns auf diesem Wege folgen würden. Unsere Konkurrenten haben es aber vorgezogen, an ihrer reichbesetzten Prämientafel sitzen zu bleiben, innerlich wahrscheinlich herzlich froh, dass sich der lästige Mitesser von ihnen entfernte. Reichstag Protokoll, 1896, Mar. 2, p. 1159.

cartell bounties, as well as government bounties.[1] One country cannot act independently, however, in many cases at least, without losing more than is gained.

From this point of view the policy of paying cartell bounties may be often necessary; the difficulties in their effective adjustment limit their extension through many grades of industry. This is true in the iron industry for the small iron products which have not yet succeeded in forming a cartell.[2] Different opinions naturally prevail in both coal and iron circles concerning this matter. It is easy to understand that on the principle of self-interest, or of real or alleged impracticability due to complexities, that the former should oppose it;[3] while in the iron industry, those who have their coal supply cannot be expected as coal producers to desire to contribute bounties to their rivals.[4] The Essen Handelskammer, which represents both coal and iron, is a strong advocate of the bounty system;[5] the Düsseldorf Handelskammer, which stands particularly near the iron interests, though supporting the policy, does not regard the present solution as satisfactory.[6] The Saarbrücken Handelskammer makes a demand on the fiscal administration for lower coal prices for the coal used in the manufacture of exports.[7] It is not difficult to comprehend why the iron interests should favor the policy; for the coal people, it means keeping alive a large demand without great reductions in price.

[1] Raffalovich, p. 198.

[2] Enquete, pp. 198–9.

[3] *Cf.* Effertz, (1895) p. 16 (Genl. Director, Königsborn).

[4] *Cf.* Gen. Direktor Williger of the Kattowitzer A. G. f. Bergb. u. Eisenhütten-betrieb and Gen. Direktor der Oberschlesische Kohlenkonvention. Enquete, p. 481. He opposes them.

[5] *Essen Hk.*, 1898, p. 6; 1902, pp. 8, 10.

[6] *Düsseldorf Hk.*, 1901, p. 17.

[7] *Saarbrücken Hk.*, 1900, p. 7.

CHAPTER VI

EFFECT OF PRICE POLICY ON INDUSTRY

We have attempted to state the facts essential to a fair view of the course of prices of coal and coke; we have now to undertake the more difficult problem of estimating their relation to the market, that is, to the industrial situation and general prices. The advance in the price of an article can be generally explained, and perhaps justified, by proof of either advance in costs or increase in demand. The first proposition is self-evident, the second would be generally admitted, unless there were some monopolistic limitation of production. Rapid industrial development often tends to produce a high level of prices; and so far as the commodities whose prices have advanced enter into productive consumption, a high level of prices tends to produce high costs. Producers of raw materials are by no means free from this extra cost. The general rise of prices also brings with it, more or less quickly, a rise in wages. But in any case, leaving the question of costs out of consideration, a general level of high prices may be regarded as characteristic of boom years for which no particular sort of industrial organization can be held responsible. During such a period, a high level of prices in a particular industry cannot be regarded as peculiarly injurious or reprehensible.

In discussing the history of the coal cartells, we have traced some points in the industrial development of Germany in the last three decades. In general, we have observed that the prosperity of the coal industry varied with the prosperity and activity of German in-

dustry as a whole, and, in particular, with iron. The most striking exception to this statement is found in the last three years, when the crisis left the iron industry crippled, while the coal industry remained prosperous. So far as coal is an object of general consumption, for house fuel, gas works, railroads, etc., the industrial situation has little effect on the demand. On the other hand, its industrial use depends chiefly on iron. According to the table for the Saar (on page 12) the consumption of coal in the iron industry (including machine factories) is 29.30%, against 14.87% for other industries. For the Ruhr, the industrial consumption, and particularly the iron consumption, is of still greater importance. The most appropriate means, therefore, of measuring the market situation in respect to coal is the price schedule of iron. For coke, on the other hand, there are two factors of great importance, viz., the price of coking-coal and the price of iron.

Yr.	Düsseldorf[1] Qualität Puddeleisen.	Dortmund.[2]		Breslau.[2]	
		Bessemer.	Thomas.	Giesserei.	Puddel.
	m.	Aver. annual	Aver. annual	Aver. annual	Ave. annual
1883	Begin. 62	60.6	48.8	63.6	57.8
1884	" 52	53.1	43.9	60.3	54.5
1885	" 47	45.8	41.3	56.5	48.3
1886	" 41	42.6	39.0	51.3	43.5
1887	" 46	49.0	43.2	54.2	49.5
1888	" 50	52.7	45.3	58.0	52.0
1889	" 52	65.9	54.8	65.0	58.5
1890	" 92	79.8	61.0	74.4	66.6
1891	" 53	62.1	49.5	54.8	48.2
1892	" 50	57.8	49.3	52.6	48.9
1893	" 47	52.0	45.5	52.5	50.2
1894	" 42	52.0	45.2	50.3	49.3
1895	" 45	52.0	45.6	49.2	48.3
1896	" 52	59.0	52.8	57.5	57.9
1897	" 60	63.4	57.5	61.7	61.3
1898	" 59	63.5	57.0	61.6	59.7
1899	" 61	65.4	58.5	75.5	72 1
1900	" 69	86.7	78.0	90.7	----
1901	" 90	----	----	66.5	----
1902	" 60	74.0	57.0	61.3	----

[1] Enquete, p. 637. [2] *Vierteljahrshefte*, 1902, p. 20.

An analysis of this table and the Essen price quotations brings out the following facts. From 1886 to 1890 Düsseldorf Puddeleisen advanced 124.4%, Essen Fettförderkohle advanced 91%, Essen blast-furnace coke advanced (1887–1890) 153.9%; fro m 1894 to 1901 Düsseldorf Puddeleisen advanced 114.2%, Essen Fettförderkohle advanced 28.8%, Essen blast-furnace coke 67.9%; the decline of the same iron from 1901 to 1902 was 50%, the decline of the same coal 6.8%, and the same coke 31.8%. A more readily perceptible comparison may be gotten by taking the ratio of the price of coal to the price of coke, and the price of coke to the

PRICE RATIOS

Year.	*One ton blast furnace coke to one ton Fettk. Essen.*	*One ton Düsseldorf Puddeleisen to one ton blast furnace coke—Essen.*	*One ton Dortmund Thomas-Eisen to one ton Essen blast furnace coke.*
1887	1.39	8.11	5.51
1888	1.51	5.46	4.95
1889	1.85	3.31	3.49
1890	1.85	4.65	3.09
1891	1.37	3.93	3.66
1892	1.41	4.17	4.11
1893	1.37	4.27	4.14
1894	1.38	3.82	4.11
1895	1.38	4.09	4.15
1896	1.46	4.33	4.31
1897	1.57	4.33	4.15
1898	1.54	4.21	4.07
1899	1.53	4 24	4.07
1900	2.08	3.24	3.66
1901	2.15	4.09	
1902	1.56	4 00	3.80
Average	1.59	4.39	4.08

price of iron. It is evident that in 1900 the coke prices rose disproportionately high with respect to iron. The iron contracts had been made largely on the ground of a lower price.[1]

The relation of coke to coal is to be judged rather

[1] Enquete p. 641.

differently; coke shows in general a steady improvement with respect to coal, but this did not come from any depression in the price of coal. The relation, on the whole, was fairly constant, and, considering that it takes about 1.43 tons of coal to make a ton of coke in the Ruhr, it is not surprising that the price advance is about half as high again. For further analysis of the coal and coke prices with respect to the principal consuming industries the following prices are quoted:

	1899[1]	*1900*[1]	*Mid year.*[1] *1901*	*July.*[2] *1903*
Bar iron	138	215	120	120
Steel rails	125	155	110	120
Girders (Saar)	105	117	110	112.50 to 115
Rods	125	185	130	120 to 122.50
Drawn wire	138	195	145	130 to 137.50
Boiler plate Ia.	143	212	180	150

Comparing these prices with those of coal (Fettförderkohle) and coke (blast furnace), we have the following price ratios. The yearly averages, also, show what

Ratio of price of	1899		1900		Mid year 1901		July 1903		Average	
	Coal	Coke	Coal	Coke	Coal	Coke	Coal	Coke	Coal	Coke
Bar iron	14.7	9.6	20.9	10.1	11.7	5.5	13.3	8.0	15.1	8.3
Rails	13.3	8.7	15.1	7.2	10.7	5.0	13.3	8.0	13.1	7.2
Girders (Saar)	11.2	7.3	11.4	5.5	10.7	5.0	12.6	7.6	11.5	6.4
Rods	13.3	8.7	18.0	8.7	12.7	5.9	13.5	8.1	14.4	7.9
Drawn wire	15.4	10.1	19.0	9.1	14.1	6.6	14.9	8.9	15.9	8.7
Boiler plate	15.3	9.9	20.7	9.9	17.5	8.2	16.6	10.0	17.5	9.5
Average	13.9	9.1	17.5	9.1	12.9	6.0	16.0	8.4	14.6	8.0

a heavy cost the coal and coke constituted in 1901, especially the coke. According to the calculations of the Abrechnungsstelle für die Ausfuhr (see p. 223), it seems, that in the production of one ton of rails, 0.6 tons of coal and 1.35 tons of coke are consumed; for bar iron, 0.9

[1] *Düsseldorf Hk.*, 1901, I, p. 17; [2] *Kölnische Ztg.*, July 7, 1903.

tons of coal and 1.4 tons of coke; for girders, 0.6 tons of coal and 1.35 tons of coke; for rods, 0.9 tons of coal and 1.4 tons of coke; for drawn wire, 1.35 tons of coal and 1.5 tons of coke.[1] Calculating the costs of coal and coke consumed per ton for rails, we have the following table:

Year.	*Price of Rails.*	*Coal.*	*Coke.*	*Total fuel.*	*% of price of rails.*
	m.	*m.*	*m.*	*m.*	
1899	125	5.62	19.39	25.01	20.0
1900	155	6.15	28.74	34.89	22.5
1901	110	6.15	29.70	35.85	32.6
1902	120	5.76	20.25	26.01	21.7

This shows in a clearer manner the effect of the rise in the price of coal and coke; the year 1901 is again the crucial year.

Having some of the essential facts about the course of prices and their relation to the industrial situation, we are in a better position to consider the various opinions expressed about them. Complaints against the high price of coal on the part of the iron industry are not new. They naturally make themselves heard at every period of high prices, and so it was in the *hausse* of 1889–91.[2] They were much louder in the *hausse* of 1899–1901, and this was due, perhaps, to the recognition of the fact that it was a more or less organized and controllable movement. As a consequence, all sorts of legislative proposals were made, the Prussian Government had an inquest by a commission, and, finally, the Cartell Enquete now in progress may be attributed chiefly to the coal combination. Denunciations from industrial or private consumers are not to be accepted as wholly impartial criticisms, and, as they have the practical object, generally, of bringing about a

[1] *Cf.* Raffalovich, pp. 25–26.

[2] *Bochum Hk.*, 1891, p. 8.

price reduction, they are not wholly disinterested. Exaggerated vigor is a necessary characteristic of such complaints. Equally unreliable, *prima facie*, are the bald assertions of the other side. The situation is made more confusing by the conflicting testimony on both sides; some consumers protest that they are well pleased with the price policy of the syndicates,[1] while some of the coal magnates regret the lack of moderation shown by members of their industry.[2] A few details of these complaints and justifications, where they deal with tangible facts, may be adduced. A representative of large iron interests in Silesia, Herr Caro, declared that for his company (Oberschlesischen Eisenindustrie A. G.) the advance in the cost of coal between 1895 and 1901 was equivalent to a dividend on the shares of the company of 6.58%.[3] The course of dividends of his company do not show, however, that it was the coal price so much as the slump in the iron market that hurt their business.[4] The claim that the price of industrial coal was too high in Silesia, was indignantly rejected by (Generaldirektor Junghann Königs- und Laurahütte) who said that he, had offered Herr Caro coal, such as the Laurahütte used for Puddeleisen, for 2.00 m., which was refused; that the prices of coal in Upper Silesia were the cheapest in the world; and the cause of the bad situation of the iron industry lay elsewhere, because the Laurahütte, with its own coal, could not make a profit on rolled

[1] Enquete, p. 142, (Roheisen) p. 193, (Kleineisen) p. 199, (Maschinen) p. 501, (Kalk).

[2] *Cf.* especially Kirdorf, *Cent. Verb. D. I.*, 1901, p. 235.

[3] Enquete, p. 465.

[4] From 1895–96 to 1902–3 the course of dividends was 2%, —, 9%, 10%, 13%, 10%, 2%, and 0%. Enquete, p. 481.

iron or small iron wares[1]. Nevertheless in Silesia, as in Westphalia, it was claimed that a distinction could be made generally between the more prosperous and the less prosperous iron industries according as they engaged in the manufacture of the raw material or not, and, also, according as they provided their own coal. That is, the so-called "pure rolling mills" and those engaged principally in the higher manufactures were in both cases at a disadvantage as compared with those that had their own blast-furnaces and engaged principally in the manufacture of raw iron.[2] The iron interests, of course, generally demanded a reduction in prices, especially the "pure rolling mills,"[3] but it was strenuously objected that this would injure the prosperity of the coal industry without improving the iron industry; that is, that the situation in the iron industry was one of over-production and reckless competition, and, therefore, any concession made in the price of coal would be immediately followed by further underbidding in the sale of iron.[4] Under the conditions that prevailed in 1901 and 1902, it is very doubtful if a substantial reduction in the price of coal would have materially increased the industrial consumption.[5] M. Perquel, writing in 1900, asserted that

[1] Enquete, pp. 484–5.

[2] *Id.*, p. 174.

[3] *Id.*, pp. 166–67, 173–6, 197–8, *etc.*

[4] *Id.*, pp. 176, 471, 484, 590. Herr Kirdorf says that, if the prices had been lowered considerably, "the crisis would have been made much severer." Herr Junghann says that the low prices of iron in Germany are the result of the over-competition of the German iron-producers. *Cf.* Tschierschky, pp. 123-4. The suggestion of this danger was made by the Bochum Handelskammer in 1898; see *Bericht*, 1897, p. 55.

[5] *Cf.* Liefmann, Schutzzoll, pp. 19, 67. A scheme to prevent a lack of correspondence between coal and iron prices is the familiar device of the sliding scale. This is used by the Eschweiler Bgw. in selling coke to iron producers. *Cf. Frankfurter Ztg.* Oct. 17, 1903.

there was no metallurgical overproduction.[1] As a matter of fact, this proved to be the case on a very large scale, and was one of the most difficult features of the crisis. The more strongly organized industries, such as coal, coke and raw iron, were able to ride through the storm better than the manufacturers of finished goods, because they not only could limit their output and maintain prices, at least to a certain extent, in the domestic market, but also they were able to develop exports, without resorting to reckless competition among themselves. The lack of union was recognized by the unorganized interests as one of the chief causes of the trouble.[2] In the case of the Westphalian small iron ware industry, this appears to have been partly due to the difficulty of establishing a cartell among such a great number of producers.[3]

One of the weakest points of the very intricate tangle of the steel industry was the fact that the strong Halbzeugverband was not cartelled with respect to exports. This resulted in cut-throat competition among its members for that part of the business.[4] The pure rolling mills were injured the most by this. The Baroper Walzwerk A. G. complains, in its annual report for 1902, that the Halbzeugverband sold so cheap abroad that the foreign rolling mills were given an advantage, not only in their local market, but also in the German market, in spite of the import taxes. The export bounties were declared insufficient. Further, the manufacture of finished products by the Halbzeug producers, in the face of the high prices they charged the

[1] Perquel, p. 31.

[2] Enquete, p. 470.

[3] *Id.*, p. 197.

[4] *Allgem. Ztg.*, 22 Nov., 1902.

rolling mills which were their customers for the half-products, put the pure rolling mills at a still greater disadvantage.[1]

When the ground of general expert testimony is left in the search of statistical proof of the allegations in respect to the iron situation, the material obtainable does not afford an entirely satisfactory basis for induction.[2] Nevertheless, the facts in the tables given below are probably fairly characteristic. The following groups may be distinguished in the iron business. (a) Blast furnaces and iron works possessing non-syndicate or independent coal mines; (b) blast furnaces and iron works possessing syndicate coal mines (for which the coal must be accounted for at syndicate prices); (c) blast furnaces and iron works which possess no coal mines (these are in a similar position to the second group, as respects prices, they have, however, less control over their supply); (d) "pure rolling mills", *i. e.*, those that have to buy iron as well as coal and coke; (e) machines and small wares. The point which requires attention, of course, is simply this,—has the undisputed profitableness of the coal industry been obtained at the expense of the iron industry, or is the iron industry unprofitable even with cheap coal? If the works in group (a) show an equal decline in profits with those of (b) and (c), we may conclude that the malady lies in the iron prices, rather than coal prices.

[1] Cited in *Allgem. Ztg.*, Nov. 5, 1902.

[2] A great deal of information respecting the situation of the iron industry has been developed in the Enquete concerning the same, the proceedings of which were published after the present writing was in the hands of the publishers. Nothing contained therein, however, has seemed to call for a modification of the views expressed here concerning its relations to the coal industry. *Cf.* Kontradiktorische Verhandlungen über Deutsche Kartelle, Hefte 5 u. 6.

If, further, the declines in groups (d) and (e) could be shown to be greater than for (c), the conclusion would be still stronger that the trouble was with the iron industry,—in this last case either with the high prices of raw iron or the low prices of the finished product. The readiest and most obvious means of comparison is the course of the stock quotations and the dividends paid. The quotation of stock, however, is an uncertain gauge of the current course of profits, on account of the fact that it stands for the future as well as the present, to say nothing of the variations caused by panic, stock manipulation, new emissions and the general state of the investment and money markets. Dividends, on the other hand, do not tell the whole story, because the policies of different companies vary greatly in respect to writing off depreciation, accumulating reserves, etc. The actual gross and net receipts show the situation from another standpoint, though here, too, the criteria are by no means sufficient to form a conclusive judgment of the whole situation. One great difficulty is that the accounts are not kept uniformly. Further, the interest obligations vary in their proportions to capital, and the necessities for writing off depreciation vary according to the character of the equipment, etc. In spite of these very important shortcomings, the following tables throw some light on the actual situation which may serve as a check on undocumented opinion or non-statistical testimony. The first part of the table covers the German iron industry of the northwest, the second, Silesian industry.[1]

[1] The data are taken, with a few exceptions, from abstracts of annual reports appearing in the *Allgemeine Ztg.* and the *Frankfurter Ztg.*

	1898–1899				1899–1900				1900–1901				1901–1902				1902–1903			
	Gross Profit	D'preciati'n	Net Profit	Div.	Gross Profit	D'preciat'n	Net Profit	Div.	Gross Profit	D'preciat'n	Net Profit	Div.	Gross Profit	D'preciat'n	Net Profit	Div.	Gross Profit	D'preciat'n	Net Profit	Div.
Non-Syndicate. (*a*)																				
Phönix	5940	2077	3549	11	8632	3097	5079	15	4185	2524	1319	4	3695	2544	604	0	5487	2527	3540	8
Dortmunder Union	6848	2503	2571	6*	10075	3079	4335	7*	6083	3073	172	0*	2706	5457	−6700	0*	6068	2772	1271	2*
Hörder	9023	2885	4797	14	9489	3062	4660	14	7861	2208	3169	10	4229	2048	----	0	6187	2600	1588	4
Eschweiler	3781	1200	2570	15	4899	1440	3459	20	5753	2000	3553	20	4821	2000	2821	16	4295	1800	2495	14
Part Syndicate.																				
Bochumer Guss.	6240	1999	4240	16⅔	6267	1681	4586	16⅔	6345	2036	4308	13⅓	3684	1579	2105	7	3644	1589	2054	7
Gutehoffnungshütte	7708	1750	----	----	10569	4300	----	----	9385	4400	3344	----	9029	3600	3599	20	----	----	----	----
Syndicate. (*b*)																				
Schalker	3451	650	2801	42½	4834	665	4183	75	4533	865	3668	32½	6237	2147	4137	30	6346	2500	3969	32½
Hoesch	----	----	----	----	6179	2621	----	16	4048	2398	1649	10	2646	2323	322	0	----	----	----	----
Aumetz-Friede	----	----	----	----	----	----	----	----	761	----	−×	0	2537	1382	477	0	----	----	----	----
Rheinisch Stahl	1586	502	1059	16	2316	515	1801	16	4630	1835	2794	10	3292	1847	1361	5	4050	1798	2248	8
No coal. (*c*)																				
Rombacher	1960	----	944	15	2844	----	1713	20	5657	1640	1743	10	5053	1747	1425	5	----	----	----	----
Westfäl. Stahl	----	458	1262	17	----	525	1337	17	1724	664	450	0	953	385	0	0	----	----	----	----
Friedrichshütte	466	113	309	10	579	133	402	13	1082	53	766	14	789	206	553	10	405	203	167	4
Georg Marien	3709	744	----	10	3873	689	----	10	2652	708	779	¼ ¾	2535	773	447	¼ ½	----	----	----	----
Pure rolling mill. (*d*)																				
Westfäl. Draht	----	----	1079	11	----	----	2479	15	1737	716	1189	10	1671	258	1054	9	----	----	----	----
Machine and small iron. (*e*)																				
Armaturen u. Masch.	685	214	476	8	664	275	389	6½	227	213	141	0	−136	202	−324	0	−309	186	−495	0
Maschinen. Karlsruhe	891	51	414	15	1051	44	480	15	1083	31	555	15	900	24	456	12½	844	21	427	12½
Maschinen. Augsburg	----	----	----	----	----	----	----	----	2685	----	1992	----	1970	----	1452	----	----	----	----	----
Düsseldorf. Bedarf	----	----	----	----	----	----	----	----	616	42	359	16	573	43	294	12	----	----	----	----
Hannover Maschin.	----	----	----	----	----	----	----	----	----	500	1919	28	----	500	1241	20	----	----	----	----
Maschinen. Deutschl.	----	----	----	----	----	----	----	----	335	77	287	14	118	52	106	6	----	----	----	----
SILESIA—*Coal.* (*a*)																				
Laurahütte	8910	3507	4631	15	10660	4500	5256	16	9691	4000	4830	14	7446	3018	3345	10	8281	3508	3679	11
Kattowitzer	----	----	----	12	----	----	----	14	4938	1650	----	14	4826	1650	----	12	----	----	----	----
Oberschles. Bedarf	----	----	----	7	----	----	----	9	4201	1997	2150	9	766	650	----	2½	----	----	----	----
No coal. (*b*)																				
Huldschinsky	3183	400	2731	12	3536	600	2683	12	1844	650	891	4	1039	650	116	0	1495	650	665	3
Oberschles. Eisenind.	----	----	----	10	----	----	----	13	4659	1750	2439	10	2451	1250	605	2	----	----	----	----

* Lit. C.

It is rather remarkable that among the iron works that possess an independent supply of coal there should be one in difficulties requiring a "Sanierung" (Dortmunder Union) and another which seems barely able to get along. There have been a couple of blast furnace concerns owning syndicate coal mines in a similar position (Hoesch and Deutsche-Luxemburgische A. G.),[1] but there are also some that have done very well (*viz.*, Schalker and Rheinische Stahlwerk), while those that have no coal supply, or none worth mentioning, either in the syndicate or out of it, seem to have done the best of all. This seems to be a point against the claim that the weakness of the iron industry was the consequence of high coal prices.[2] In the following table we have the dividends (D) and stock quotations (Q) of the principal iron producers.[3] (See next two pages).

A comparison of the dividends and quotations of the dark years 1894 and 1901 show a higher average rate of interest for the latter. In the former period, the price of coal and coke was very low, but the iron industry remained unprofitable. So far as this analysis goes, it seems to show that high coal prices or low coal prices have not made a very great difference in the profit of the iron industry, but, of course, a difference of a small amount seems of considerable importance in hard times.

Complaints came from other industries also of the

[1] The affairs of the latter before its successful reorganization by the Bank f. Handel u. Industrie are too complicated to appear in the table.

[2] It seems to cast some doubt, also, on the extent of the advantages of combinations of successive stages of industry (Combinierte Betrieb); *cf.* Sombart, I, p. 554; Sinzheimer, p. 20; Calwer, 1901, p. 267; Enquete, p. 675.

[3] Data are from Saling's *Börsen Papiere*, 1903–4.

	1889.		1890.		1891.		1892.		1893.		1894.		1895.		
	D.	Q.	D.	Q.	D.	Q	D.	Q	D.	Q .	D.	Q.	D.	Q.	
(a)															
Hörder St. A.	0	----	0	----	0	----	0	----	0	----	0	----	0	----	Wholly or mostly non Syndicate.
									Lit A						
" Vorz. A.	0	----	0	---	0	----	0	----	0	---	3	----	5	----	
Union Lit. A.	4	137.25	2	84.50	1	55.20	1	54.10	0	56.30	0	58.50	0	53	
" Lit. C.	----	----	----	----	----	----	----	----	----	----	----	----	5	----	
Bochumer Guss.	10	287.90	6½	160	6⅓	117.50	3½	118.40	4½	128.10	5	140.60	7	149 40	
(b)															
Hoesch	----	----	5	----	5	----	5	----	5	----	7½	----	7½	----	Syndicate.
Schalker	----	152 50	6	111.25	10	85.50	9	109.25	9	113.60	7½	140.80	15	146.75	
Rhein. Stahl	13⅓	201.20	11	164.50	10	137.50	8	146	10	137	10	154.90	11	176	
(c and d)															
Friedrichshütte	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
Westfäl. Stahl	----	----	----	----	0	----	6	----	12½	----	12	154.60	13½	176	
Rombacher	0	----	0	----	0	----	5	----	6	----	7	----	8	----	
Georg Marien	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
Gelsenk. Guss.	10	----	10	121	4	94.75	0	68 75	2	60.50	2	70	4	81.80	
Wittener Guss.	13½	173.50	10	141.25	10	115	5½	117	6½	113.75	6½	123	7½	141.50	No coal or practically none.
Hagener Guss.	10	153.50	8	141.50	6½	116.25	2½	106.30	4	94.75	6	93.10	4½	111.75	
Geisweider	----	----	----	----	----	----	----	----	0	----	0	----	7	----	
Hasper Eisen u S.	----	----	----	----	----	----	----	----	----	----	0	----	0	----	
Lothringer E. St. A.	0	----	0	----	0	----	0	----	0	----	0	----	0	----	
" Pr. A.	6	----	4	----	1	----	1	----	0	----	0	----	0	----	
Rhein. Bg. u. H.	0	----	8	----	2	----	1	----	3	----	3	----	5	----	
Wissener Bgw.	----	----	----	----	0	----	6	----	12½	----	12	154.60	13½	176	
Charlottenhütte	----	----	----	----	----	----	----	----	6	----	6	----	6	----	
Donnersmarck	4	126.25	8	111	6	81.50	6	81.50	6	94.50	6	116	8	143 70	(Coal.)
Kattowitzer	10	142	10	128.25	8	122 75	8	109	8	129.60	8	138	8	154	"
Laura	11	173.25	8	139	4	105	3	90.90	4	112	4	121.75	8	142	"
Huldschinsky	----	----	----	----	----	----	----	----	----	----	11	----	15	----	(No coal.)
Bismarck	----	----	----	----	----	----	----	----	----	----	----	----	----	----	"
Oberschl. Bedarf	6	121.75	5	91.90	2	53	½	40.52	2½	76.40	3	71.75	½	91.60	(Coal.)
Oberschl. Eisen	14	216.75	11	174	6	124.50	4½	101.50	3½	100.25	2	82	2	95	(No coal.)

	1896.		1897.		1898.		1899.		1900.		1901.		1902.		
	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	D.	Q.	
(*a*)															
Hörder St. A.	0	----	2	----	9	----	9	----	5	----	0	----	----	----	Wholly or mostly non-Syndicate.
" Vorz. A.	8	----	11	----	14	----	14	----	10	----	0	----	----	----	
Union Lit. A.	----	49.90	----	48 50	----	----	----	----	----	----	----	----	----	----	
" Lit. C.	5	102.25	5	98.10	6	98.50	7	133.25	0	82.20	0	42 30	----	----	
Bochumer Guss.	12	166.50	15	204.75	16⅔	229	16⅔	260.30	13⅓	175 30	7	174	----	179.10	
(*b*)															
Hoesch	12	193	12	180.25	15	187.25	16	217.75	10	156 50	0	138.50	----	145.10	Syndicate.
Schalker	22½	228.90	30	286.90	42½	353	75	588	32½	315	30	286	----	345	
Rhein. Stahl	15	191.50	15	203.75	16	217 25	16.	223	10	158.50	5	138.50	----	140	
(*c* and *d*)															
Friedrichshütte	10	----	10	----	10	----	13	----	14	141	10	126	----	135	
Westfäl. Stahl	15	192.90	15	200.50	17	208	17	229	0	152.75	0	114.80	----	122	
Rombacher	12	----	13	----	15	204.50	20	276.75	10	170	5	133.25	----	150.25	
Georg Marien	----	----	----	----	10	----	10	----	{ 5 4	----	{ 5 2	----	----	----	
Gelsenk. Guss.	8	116.10	12	163.70	14	188 60	12	207.25	0	126	0	87	----	99	
Wittener Guss.	10	150	16	181.50	18	232	20	259	12	171.50	7	151	----	153	No coal or practically none.
Hagener Guss	6½	113	6½	129 50	6	134.50	6	125	0	81.75	0	55.75	----	34 75	
Geisweider	14	----	14	158	20	196	25	316.25	12	190.25	0	144.75	----	142 50	
Hasper Eisen u. S	10	----	10	105	22½	249.50	30	364 50	0	196	2	127.50	----	148	
Lothringer E. St. A.	0	27.25	0	27.50	0	24.75	1	47.25	0	31.10	0	23	----	27.90	
" Pr. A.	2¾	----	3	----	5	----	6	----	1½	----	0	----	----	----	
Rhein. Bg. u. H.	8	139	10	154 50	10	141.50	10	166.70	12	132.75	0	95	4	98.50	
Wissener Bgw.	15	192 90	15	200.50	17	208	17	229	0	152.75	0	114.80	----	122	
Charlottenhütte	22½	----	12	----	12	148.75	0	180 25	0	----	0	77.75	----	76.30	
Donnersmarck	9	160.25	10	164 80	12	191.80	15	230	16	212.75	14	191.75	14	210.10	(Coal.)
Kattowitzer	10	161.75	12	175 60	12	190.50	14	223.60	14	188.50	12	180.30	11	201	"
Laura	10	163.80	13½	184.40	15	217	16	253 50	14	194 30	10	185.80	----	211.75	"
Huldschinsky	15	----	12	----	12	163	12	161.75	4	120	0	86	----	101.25	(No coal.)
Bismarck	----	----	15	210.80	19	212.25	24	316.50	12	230	10	192	----	220	"
Oberschl. Bedarf	5	108.90	6½	118.25	7	130.50	9	127.90	9	99.90	3	105.50	2½	----	(Coal.)
Oberschl. Eisen	8	132	9	133.90	10	153.90	13	184	10	121.30	2	100.20	0	91.90	(No coal.)

high price of coal, but, as in the iron industry, the testimony is conflicting. In the case of many of them the coal consumption is such an unimportant factor that they may be passed over with the briefest mention. This is the case, for example, with the textile industry and sugar manufacture.[1]

It is otherwise with cement and lime, which not only consume tolerably large quantities, but for which the cost of coal forms a very important item in the cost of production. A representative of the cement industry declared that on account of the excessive competition in northwestern Germany, no reduction of coal prices would have availed.[2] The representative of the cement industry of Upper Silesia expressed satisfaction, on the whole, with the price policy of the convention.[3] For the lime industry (in which 30 tons of coal are required for every 100 tons of lime produced) the representative of the Upper Silesian producers, asked for price reductions.[4] The inland navigation interests are also important consumers of coal. Herr Gothein (a persistent opponent of cartells) declared that the high coal prices had greatly injured the navigation interests of the Oder.[5] Another representative of the Oder ship-

[1] *Cf.* for textiles, Enquete, pp. 496, 498; *Aachen Hk.*, 1900, p. 103; *Industrie Ztg.*, 1901, p. 270, (meeting of the Verband der Textilen Industriellen von Chemnitz); Tschierschky, pp. 123–4; and for sugar, Enquete, pp. 408, 410, 412; *Oppeln Hk.*, 1900, p. 37.

[2] Enquete, p. 123.

[3] *Id.*, p. 502. For the 18 to 20 concerns listed on the Berlin Börse the average dividends were 1897: 11.4%, 1898: 14.0%, 1899: 15.6%, 1900: 11.2%, 1901: 3.3%. (Compiled from *Allgemeine Ztg.*, June 22, 1902). It is evident that the great prosperity of the industry developed under high coal prices, and the decline came before they had reached their maximum.

[4] *Id.*, p. 501.

[5] *Id.*, p. 515.

ping (of the fleet of the coal dealer Friedländer) declared that the unprofitableness of the business was not due to the price of coal, but to the bad conditions of navigation.[1] The attitude of the great ocean shipping firms is interesting, especially from the fact that they are not dependent on German coal. Direktor Bremermann, of the Norddeutsche Lloyd testified that they have naturally had rather pleasant relations with the German coal producers, but that, nevertheless, they have decided to acquire their own mines, in order, first, to assure themselves of just the right sort of coal, and, secondly, to make themselves independent of the combinations.[2]

The relations of the railways (which are owned almost entirely by the states) with the coal producers do not need particular discussion. In Saxony, as well as in Prussia, there are fiscal coal mines.[3] The railways have an ample means of self defense against extortion through their control of the railway rates. The Prussian government buys a large part of its locomotive coal, and is able to get favorable prices from the syndicate.[4]

The fact that the Prussian government is a coal producer, as well as a coal consumer, rather complicates its policy. At the time of the foundation of the syndicate, a price advance of .50 m. (to 8.50) was agreed to by the government in its contract for locomotive coal. This caused a considerable outcry, but a spokesman of the coal interests (Dr. Reismann) pointed out

[1] Enquete, p. 517.

[2] *Id.*, p. 505.

[3] *Jahrb. f. d. Bergbau u. Hüttenwesen im Königr. Sachsen*, 1902, p. 9.

[4] *Cf. Zeitung d. Vereins Deutscher Eisenbahn-Verwaltungen*, 1900, p. 21.

that, though this meant an extra expense of 1¾ millions on the 3,500,000 tons purchased, yet, when the same advance was followed by the fiscal works on over ten million tons production, the state would gain 3,325,000 m.[1]

The imperial marine has no mining interests to take account of, and it buys its coal where it is cheapest. In 1892, we find the Ruhr producers complaining that English coal is taken instead of German.[2] The former was four or five marks cheaper at the place of delivery. In 1900, during the coal famine, the XVIII army corps bought English coal.[3]

Most important of all, perhaps, in the consumption of coal, is the general consumption for cooking and house-heating. Especially in an industrial country which competes in the world market, an enhancement of the cost of living must be extremely injurious. High prices of coal have unquestionably a peculiarly bad effect on the individual, the injuries resulting from excessive economies in this direction being as insidious as they are serious. Dear coal may be likened to dear bread or meat, in contradistinction to dear sugar or spirits. The general consumer, moreover, is peculiarly unfitted to cope with extortionate price advances in this commodity, and his activity is aroused rather to secure the necessary quantity than to obtain it at a reasonable price. Whether abuse exists in this quarter or not is a more difficult question, and it may be said that it can only be approached successfully from the second criterion of price policy, namely, profits—any price policy, that is, which leads to an inordinate profit must be highly prejudicial to the general consumer.

[1] *Cf.* Effertz, (1894), p. 6.

[2] *Dortmund Hk.*, 1892, p. 12.

[3] Reichstag, 1900, p. 277.

CHAPTER VII.

PROCEEDS AND PROFITS.

The second criterion for judging the reasonableness of coal prices is cost and profit. We have already analyzed the situation with respect to costs, it now remains to compare costs with proceeds and to determine

PROCEEDS PER TON.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Aplerbecker	----	10.33	10.61	8.90	7.51	7.56	7.45	7.61	8.04	7.98	8.17
Baakermulde	5.67	8.54	8.73	7.33	6.94	6.71	6.59	6.79	7.60	8.11	8.56
Bickefeld	7.64	10.33	10.69	8.79	7.55	8.09	8.62	8.97	9.39	9.17	9.58
Bochumer Bgw.	----	----	----	----	6.83	7.20	6.94	7.34	7.90	8.32	8.57
Borussia	----	----	----	----	----	----	6.61	6.42	6.90	7.38	8.12
Concordia	----	----	----	----	----	7.59	7.72	8.01	8.06	8.37	8.92
Dahlbusch	6.43	9.84	10.00	8.71	7.42	7.72	8.17	8.11	8.38	8.49	9.05
Dahlhauser	6.23	8.93	10.30	8.30	7.94	6.90	7.55	7.47	8.20	8.56	9.09
Dannenbaum	5.55	8.45	9.76	9.10	7.31	6.87	7.08	7.33	7.45	8.06	8.44
Dorstfeld	5.99	8.76	9.31	8.19	6.92	7.30	7.53	7.75	8.27	8.54	9.26
Louise Tiefb.	----	----	----	----	7.24	7.46	7.61	8.12	8.25	8.42	9.30
Bruchstrasse	----	----	----	----	7.66	8.89	8.42	8.48	8.32	8.41	9.16
Eiberg	6.65	9.01	9.92	8.54	7.58	7.27	7.59	7.67	8.15	8.07	8.67
Eintracht	----	----	----	----	----	----	7.55	7.73	8.00	8.35	8.66
Ewald	7.47	11.19	11.10	9.94	8.63	8.59	8.53	8.56	8.62	8.71	9.16
Friedl. Nachb.	6.57	9.29	9.77	7.97	6.79	7.15	7.37	7.69	8.23	8.37	9.30
Friedr. Ernest.	5.91	8.48	8.76	8.34	7.73	8.26	8.29	8.14	8.48	8.74	9.30
Gelsenkirchen	8.89	----	----	----	----	----	7.30	7.43	8.01	8.51	8.89
Graf Beust	----	----	----	----	----	----	7.71	8.12	8.24	8.45	8.98
Graf Bismarck	6.72	9.30	11.08	9.78	8.46	8.73	8.70	8.59	8.78	8.90	9.43
Graf Schwerin	----	----	----	----	----	----	7.88	7.93	7.84	8.67	8.98
Harpener	----	----	9.77	7.88	7.43	7.89	7.94	8.09	8.37	8.64	9.52
Heinrich	6.94	9.42	9.46	8.67	7.34	7.29	7.67	7.34	7.96	7.92	8.44
Helene Amalia	----	----	----	----	8.47	8.24	8.78	9.53	10.87	12.69	13.06
Hercules	6.10	11.65	12.64	10.32	9.43	8.24	7.97	7.91	8.08	8.57	9.01
Joh. Deimelsb.	----	----	----	----	----	----	7.60	8.02	8.98	8.43	9.77
Jul. Phillip	----	----	----	----	----	----	6.00	6.69	7.64	8.08	8.83
König Ludwig	6.38	9.03	9.20	8.74	7.52	7.76	8.13	7.92	8.76	8.87	9.74

profits. There are three ways open to approach this question; first, to compare costs per ton and proceeds per ton; second, to get the actual profit; third, to get the dividends and quotations of stock. The Dortmunder Jahrbuch for 1901 contains data from which the foregoing and following statistics concerning the proceeds of the

PROCEEDS PER TON—CONTINUED.

	1889	*1890*	*1891*	*1892*	*1893*	*1894*	*1895*	*1896*	*1897*	*1898*	*1899*
Königsborn	6.06	8.48	8.13	7.27	6.05	6.20	6.36	6.70	7.37	8.07	8.33
Langenbrahm	----	----	----	----	----	----	9.71	9.96	10.68	10.80	10 49
Lothringen	7.05	11.69	10.89	8.52	5.57	7.40	7.44	7.62	8.12	8.60	9.23
Magdeburg	----	----	----	----	----	----	----	8.60	8.86	8.97	9.49
Mansfeld	----	----	----	----	----	7.51	7.60	7.75	8.16	8.61	8.77
Mark	8.29	9.67	8.66	7.12	6.58	6.90	6.96	7.38	7.62	7.77	8.44
Massen	6.23	9.43	8.19	7.41	6.56	7.04	7.37	7.74	8.20	8.61	8.84
Mont Cenis	----	----	----	----	7.25	7.73	7.71	7.94	8.00	8.45	9.32
Rosenblumendelle	----	----	----	----	----	5.91	6.35	6.66	7.11	7.21	8.08
Portingssiepen	8.16	10.82	11.51	11.24	7.65	8.69	8.99	9.37	9.79	10.61	10.92
Preuss. Clus	10.68	12.27	12.34	11.78	10.82	10.85	11.04	10.93	10.75	10.97	11.27
Prinz Friedr.	3.54	5.63	6.68	6.08	5.12	5.27	5.60	5.05	4.62	4.60	5.15
Rhein. Anthrac.	8.70	8.32	7.92	5.91	5.70	5.05	6.40	6.51	7.37	7.34	8.15
Richsradt	5.55	7.16	7.31	6.27	5.68	5.83	5.23	5.53	6.10	6.29	6.48
Schür. and Charl.	6.45	8.98	8.74	7.57	7.09	7.29	7.08	7.45	7.88	7.84	8.26
Sieben Planeten	7.25	9.80	9.75	8.40	7.80	7.75	8.40	8.00	7.71	8.58	8.95
Steingatt	5.75	7.84	9.06	9.16	8.70	8.39	8.50	8.95	9.67	9.96	10.16
Trappe	7.10	9.59	9.90	8.91	7.97	8.06	8.00	8.42	8.27	8.41	9.13
Tremonia	6.77	9.75	8.64	7.73	7.36	7.65	7.85	7.75	8.01	8.60	9.34
Caroline	7.55	10.01	10.73	8.66	7.64	7.36	7.35	7.47	8.36	8.35	8.68
Deutschland	----	----	----	----	----	7.44	7.44	7.72	8.03	8.25	8.45
Friedr. d. Gr.	----	----	----	----	----	----	8.11	7.98	8.29	8.39	9.21
Wiendahlsbank	----	----	----	----	6.49	6.37	7.09	7.81	7.92	8.09	8.99
Average	6.81	9.42	9.66	8.44	7.37	7.46	7.64	7.82	8.21	8.49	9.02

individual mines are compiled. Marked differences, it will be observed, exist between the average proceeds of the different mines; particularly low are Königsborn and Dannenbaum with 7.18 and 7.76, respectively, for the period given, while Portingssiepen and Preussische Clus with 9.80 and 11.25, respectively, are very high. The average annual proceeds obtained by the mines in this table cover a considerable part of the total output of the district (in 1899 about 45%), and may be taken as fairly representative. These figures cover the period from 1889 to 1899 inclusive. Official figures for the receipts of the syndicate are obtainable from 1894 to 1902 inclusive.[1] Taking the two together, we have a means of judging the proceeds from 1889 to 1902. The

	Syndicate, proceeds per ton.	*Mines tabulated above, proceeds per ton.*
1889	—	6.81
1890	—	9.41
1891	—	9 99
1892	—	8.44
1893	—	7.37
1894	7.83	7.46
1895	8.02	7.64
1896	8.14	7.82
1897	8.45	8 21
1898	8.62	8.49
1899	9.14	9.02
1900	10.56	—
1901	11.01	—
1902	10.30	—

correspondence between the two columns for the years in common is close enough to enable an approximate estimate to be made of the proceeds per ton for the whole district between 1889 and 1893.

Taking those mines for which we have also the sta-

[1] Enquete, p. 279.

tistics of annual average cost per ton (see pp. 154-155), we obtain the following table of average *net proceeds* per ton:

Of the mines given in this table only two worked any length of time below the margin of cost of produc-

NET PROCEEDS PER TON.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Alperbecker	----	4.19	3.54	1.88	.36	.56	.40	.61	.79	.84	.12
Bickefeld	.76	1.11	3.38	1.83	.60	1.18	1.23	.25	.86	.43	1.14
Concordia	----	----	----	----	----	1.41	1.45	2 51	2.24	2 06	2.24
Dahlbusch	----	----	4.46	2.85	1.72	2.05	2.34	2.26	2.24	2.07	2.08
Dalhauser	1.14	2.89	3.65	1.43	.18	—.23	—.15	—4 28	—.52	—1.15	.57
Dannenbaum	—.08	2.20	3.54	3 19	1.55	.78	.92	1.08	.62	.34	.14
Dorstfeld	—.92	.85	1 26	0	—.47	.13	0	.75	1.08	.63	.59
Louise Tiefb.	----	----	----	----	1 59	2.15	2.03	2.33	1.54	1.25	2.13
Bruchstrasse	----	----	----	----	.38	.58	.79	.55	.22	—.03	.53
Eiberg	1.60	3.49	3.24	2.05	1.47	1.38	1.52	1.33	1.46	1.40	1.70
Eintracht	----	----	----	----	----	----	1 34	1.69	.93	1.16	.98
Ewald	1.48	4 94	4.51	3.66	2.61	2 34	2.63	3.30	2.82	3.04	2.23
Friedl. Nachlb.	—.36	1.37	1.12	.74	.58	—.30	.59	1.26	.07	—1.28	1.84
Gelsenkirchen	----	----	----	----	----	1.50	1.88	1.97	2.22	2.34	2.31
Graf Bismarck	1.32	3.79	4.99	3.86	2.53	2.88	3.19	2.92	2.52	2.29	2.57
Graf Schwerin	----	----	----	----	----	----	1.24	1.07	.30	1.33	1.33
Harpener	----	----	3.52	2.21	1.81	2.19	2.14	2.35	2.29	2.15	2.19
Heinrich	1.67	3.68	4.17	2.25	1.15	1.23	1.79	1.28	.40	.36	.70
Joh. Deimelsb.	----	----	----	----	----	----	1.51	1.71	1.95	1.34	1.49
Jul. Phillip	----	----	----	----	----	----	—.68	—.18	,81	.70	.28
König Ludwig	0	2.37	1.78	1.82	1.10	1.37	1.71	1.47	2.02	1.58	1.62
Langenbrahm	----	----	----	----	----	----	2.33	2.89	3.73	3.48	2.69
Magdeburg	----	----	----	----	----	----	----	3.00	2.94	2.80	3.15
Mansfeld	----	----	----	----	----	4.65	4.72	4.71	5.05	5.11	5.10
Mark	2.01	1.93	.92	.66	.48	1.01	1.00	1.21	1.25	.93	.60
Massen	.91	2.16	1.35	.69	.25	.62	.64	.74	.63	1.14	1.11
Mt. Cenis	----	----	----	----	.67	1.53	1.30	1.27	1.36	2.01	2.68
Rosenblumendelle	----	----	----	----	----	----	----	—.05	—.54	—3.98	—3.25

tion (Deutschland and Dahlhauser); none of them worked continuously near it. The total annual average net proceeds per ton ranged from .71 to 2.86. The highest figure came in 1891 when the *hochconjunctur* had already passed by, but it must be remembered that

NET PROCEEDS PER TON—CONTINUED.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Preuss. Clus	—2.04	1.78	1.72	.97	.58	.35	.56	.24	—.58	—.58	—.21
Prinz Friedr.	—1.57	—1.44	2.06	.60	.10	.31	.46	.05	.37	—.23	.81
Rhein. Anthr.	3.35	2.89	2.70	.88	.76	.06	1.48	1.86	2.36	1.37	2.19
Richsradt	.81	2.32	2.40	1.41	1.22	.91	.73	1.30	1.57	1.77	1.43
Schür. and Charl.	.95	2.28	1.93	.80	.59	.49	.61	.90	1.36	.59	.59
Sieben Planeten	---	---	---	---	---	---	---	---	1.33	1.51	1.60
Steingatt	1.42	3.14	3.99	2.14	.57	.56	.18	.25	.51	.95	—.14
Trappe	.88	3.03	3.69	2.95	1.67	1.08	1.91	2.40	2.25	2.09	2.20
Trenionia	—.06	.13	1.27	.83	.85	1.24	1.07	1.02	1.03	1.29	1.42
Caroline	.61	2.39	3.37	1.84	1.28	1.07	.30	.05	1.45	.99	.65
Deutschland	---	---	---	---	---	—.59	.31	—.33	1.24	—2.37	1.11
Friedr. d. Gr.	---	---	---	---	---	---	.71	.61	1.22	1.04	.73
Wiendahlsbank	---	---	---	---	.68	.50	.63	.90	.09	—.16	.39
Average	.71	2.34	2.86	1.73	.96	1.09	1.23	1.23	1.35	1.04	1.31

while current prices may conform to the market situation, the proceeds lag behind it about a year in the coal business, because the contracts are made for a year, and often sometime in advance of the beginning (April 1) of the term.[1]

If we take the official figures of cost of production for the *Dortmund district* (see p. 156), and subtract them from the actual proceeds per ton given by the *syndicate*, we have another approximate means of getting at the net proceeds per ton. The results here are

	Syndicate proceeds p. t.	*o. b. a. b. Dortmund cost p. t.*	*Approx. net proceeds p. t.*
1894	7.83	6.38	1.45
1895	8.02	6.66	1.36
1896	8.14	6.77	1.37
1897	8.45	7.04	1.41
1898	8.62	7.32	1.30
1899	9.14	7.66	1.48
1900	10.56	8.54	2.02
1901	11.01	8.77	2.24
1902	10.30	8.39	1.91

not greatly different for corresponding years from those given in the table of mines above (average difference equals .18 m.), but this table gives the net proceeds for three more years, 1900 to 1902, critical years of the syndicate's price history. The advance in net proceeds, in that period, was very marked, compared with the previous course, though the advance posi-

[1] The following table, compiled from the abstracts in the press of the annual reports of Harpener, connects with the facts given above for that mine the figures of the two following years :

	Proceeds.	*Cost.*	*Net proceeds.*
1899–1900	9.52	7.33	2.19
1900–1901	10.70	7.62	3.08
1901–1902	10.29	7.61	2.68
1902–1903	9.67	7.45	2.22

Allgem. Ztg., Oct. 18, 1900; Oct. 16, 1902; *Frankfurter Ztg.*, Oct. 14, 1903.

tively was not so great as would be imagined—at the maximum about .75 per ton above the proceeds of 1899.[1]

Figures of net proceeds per ton do not convey any very definite idea of the profitableness of the business, unless we know the amount of capital per ton required to produce it. Graf Kanitz, in his well known *brôchure* in 1891, declared that ten marks of share capital per ton was a reasonable estimate.[2] This estimate was very sharply attacked by Generaldirektor Effertz (Königsborn), who, on the basis of an elaborate statistical analysis[3] of about 80% of the coal output of the Ruhr between the years 1873 and 1890, found that the average capital invested per ton was 17.11 m. share capital and 2.90 m. bonds (or the equivalents for Gewerkschaften) giving a total capital investment of 20.09 m.[4] The maximum was 24.54 in 1874, and it diminished quite regularly down to 1890, when it was 18.14 m. The value of obligations per ton in 1890 was 3.11 m. and share capital, 14.99 (reductions of capital 0.04). Effertz uses this figure of 20.09 m. (average total capital per ton) to reckon the per cent. of profit for 1894, and finds it to be 4.18%. As there had been an almost perfectly steady decline in the amount of capital per ton output, it would have been more judicious in figuring on the year 1894 to have used the ratio of 1890 (the latest year) which was 18.14. The question also arises whether in calculating the profits of an industry the obligations should be included with the share capital. Effertz excludes

[1] Effertz calculates the net proceeds for 1894 at .84 m.; Effertz, 1895, p. 14.

[2] Kanitz, pp. 9–10.

[3] Effertz, 1891, p. 11.

[4] Including .07 m. for reduction in nominal amount of share capital.

them for the first semester of 1894 in his earlier pamphlet,[1] but he includes them in his calculation for the whole year 1894 in a later one.[2] The latter course is undoubtedly the more correct of the two.

If we examine the figures of share capital and obligations for 1902 for the mines given in the table on page 30, we have for 13 mines producing 22.1 millions tons (equal to about 38% of the total of the Ruhr) a total share capital of 252,700,000 m., and current obligations of 68,147,893 m.; a total of 320,847,893 m. Figured per ton, this is 11.43 m. of share capital, 3.08 m. of obligations; a total of 14.51 m. It is impossible here to take account of the important questions of repayment of obligations from earnings, writing off depreciation and accumulation of reserves, though these obviously are important in estimating the actual capital employed. In recent years, the policy of the mining companies has been very liberal in this respect, so that a larger amount of capital is employed than appears from the mere consideration of share capital and obligations. Assuming, however, as the least amount of capital that can come into consideration, 14.50 m. per ton for 1902, and taking Effertz's figure of 18.14 m. for 1890, we have a mean investment of capital per ton, between 1890 and 1902, of 16.32 m. Using this as a basis, we may calculate the per cent. of profit on the tables of net proceeds given above (pp. 250–1). The agreement in these two tables is not remarkably close, but is as close as could be reasonably expected. Both agree in putting the rate of profit, generally, considerably higher than Effertz's calculation for 1894.

[1] Effertz, 1894, p. 16. Graf Kanitz does not mention them.

[2] *Id.*, 1895, p. 13.

Year.	Table of Mines pages 250–1.		Syndicate.	
	Net proceeds per ton.	Estimated per ct. profit	Estimated net proceeds per ton.	Estimated per ct. profit
1889	.71	4.4	----	----
1890	2.34	14.4	----	----
1891	2.86	17.5	----	----
1892	1.73	10.6	----	----
1893	.96	5.9	----	----
1894	1.09	6.7	1.45	8.9
1895	1.23	7.5	1.36	8.3
1896	1.23	7.5	1.37	8.4
1897	1.35	8.3	1.41	8.7
1898	1.04	6.4	1.30	7.9
1899	1.31	8.0	1.48	9.0
1900	----	----	2.02	12.4
1901	----	----	2.24	13.7
1902	----	----	1.91	11.7

On the other hand, the sweeping assertion of Graf Kanitz that in 1890–91 the mines earned on an average a dividend of 45% appears as a wild exaggeration.[1] Of course, some mines made immense profits while others lost.[2]

The second method to get at the profits of the coal industry is to take the actually divided profit. The tables on the following pages (pp. 256–7) represent the situation fairly well.[3]

For the period from 1870 to 1888 inclusive, these mines averaged 6.9%; from 1875 to 1888, a period of thirteen years, the average was only 3.2%. Generaldirektor Effertz makes a calculation (covering from 74% to 84% of the total production of the region), according to which the dividends and divided profits from 1873 to 1890 inclusive were as follows:[4]

1873	*1874*	*1875*	*1876*	*1877*	*1878*	*1879*	*1880*	*1881*
18.2	12.2	4.5	2.1	1.5	1.5	1.6	2.8	2.3
1882	*1883*	*1884*	*1885*	*1886*	*1887*	*1888*	*1889*	*1890*
2.6	3.8	2.4	2.1	2.2	2.3	3.0	5.5	13.6

[1] Kanitz, p. 9.

[2] On this basis Harpener appears to have earned 13.4% in 1899, 18.9% in 1900, 16.4% in 1901 and 13.6 in 1902, see p. 250, note.

[3] Saling, 1903–4.

[4] Effertz, 1891, p. 12.

DIVIDENDS.[1]

	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888
Aplerbecker	9½	9½	18	24	20	7	3	0	0	1	4½	5⅓	5	5	4½	0	1½	3½	3½
Arenberg.	6	20	25	40	25	10	0	0	0	0	6	3	5	6	6	6	7	8	15
Kölner Bgw.	5	10½	15	25	12	5	0	0	2	3	4	5	5½	7	5	5	4	4	6
König Wilhelm	--	--	--	--	--	0	0	0	0	0	0	0	0	0	0	0	0	--	--
Gelsenkirchen	--	--	--	17	10	7½	5½	6	6	7	7½	7	7	6	6	5½	5½	6	7
Harpener	15	25	60	40	15	0	0	2½	2½	3½	5½	2	3½	0	0	0	0	2½	6
Hibernia	--	--	--	13	4	2½	1½	2½	2¾	3⅓	7½	4	5⅓	6	6	6	5½	4½	7½
Louise Tiefb.	--	--	--	10	0	0	0	0	2	2⅓	1	1	2½	2	0	--	--	--	--
Nordstern	--	--	--	0	0	0	0	0	0	0	0	--	1⅔	1⅔	0	1⅓	1⅓	1⅓	1⅔
	8.9	16.2	29.5	21.1	10.8	3.6	1.1	1.2	1.7	1.2	4	3.5	3.9	3.7	3.6	3.0	3.1	4.3	6.7

[1] Effertz, 1891, pp. 12–13.

The average here for the whole period is 4.7 per cent. Taking the period in common, *i.e.*, 1873–1888 inclusive the averages are 4.8 and 4.2 per cent. respectively.

The average of the mines here given shows a much higher percentage of profit than was obtained by our calculation from proceeds per ton. These mines, however, are undoubtedly better than the average.

DIVIDENDS.[1]

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902
Aplerbecker	12	25	13⅓	7	3	0	5	2½	4	5½	2	6	6	4
Arenberg	30	80	80	40	30	35	40	50	60	65	75	50	45	35
Bergb. u. Schiff.									6			9		6
Bochumer Bgw.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kölner Bgw.	7	20	20	10	5	6	9	12	16	20	30	33⅓	30	35
Concordia		14	10	5½	4	5½	7½	13	19	19	21	29	25	18
Consolidation	5½	21	20	12	8	8	12	15	18	22	25	30	27	27
Dahlbusch[2]	9⅓	22	22	13⅓	8	9⅓	10	11⅓	12	11⅓	11⅓	13⅓	13⅓	
Dannenbaum[3]	10	10	8	4½	3	2½	3	4½	4½	4				
Königsborn								6½	8	8	10	12	8	7
König Wilhelm, St.	11	25	22	5	3	5	5	12	15	15	20	15	15	12
" Pr.	16	30	27	10	8	10	10	17	20	20	25	20	20	17
Gelsenkirchen	7	12	12	9	6	6	7	7½	9	10	10	13	12	10
Harpener	15	20	10	5	3	5	6	8	9	10	11	12	10	
Hibernia	8½	19	12	5½	4	5½	7½	9½	12	12	12	15	13	10
Louise Tiefb., Kon. A.	9	10	3	0	0	0	0	0	0	0	1	2	0	
" St. A.	13	14	7	0	0	0	0	4	4	4	5	6	0	
Magdeburg	9	23⅓	33⅓	20	12	13⅓	25	28⅓	30	27	35	46⅔	42	35
Massen		9	5	0	0	0	2	4	4	6	9	11	7	5
Mark[2]		10	4	0	0	4	5	6	6	0	0	5	5	
Mülheimer										10	4½	7	5	5
Nordstern	3	6	2½	0	0	4	7	10	10	14	16	20	20	16
Rhein. Anthrac.	10	10	7	3½	2½	0	5	7½	5	5	10	10	9	
Pluto,[3] St. A.	3	25	15	11⅓	5	5¼	8½	11	20	20				
" Pr. A.	5	25	15	11⅓	5	5¼	8½	11	20	20				
Neu Essen[3]	26⅔	60	66⅔	33⅓	30	30	28	30	30	35	35	35		
	10.9	21.3	18.0	8.9	6.1	6.6	9.2	11.7	13.7	14.5	16.1	17.4	14.9	15.1

[1] Saling, 1903–4. [2] Enquete, p. 92. [3] *Dortmunder Jahrb.*, 1901.

Unfortunately, complete statistics in this form are not obtainable, because for a large part the "Gewerkschaft" organization takes the place of the "Actiengesellschaft," and a distribution of profits is made at a specific sum per "Kux" instead of a percentage on shares. We give below a table (pp. 259–60), compiled from the *Dortmunder Jahrbuch* (1901), of the divided profits (Ausbeute) and the assessments (Zubusse) levied per Kux for number of mines between 1885 and 1900.

An examination of the algebraic totals shows the course of profit, and this has substantially the same curve as that found for the corporations given in the following table. The most marked discrepancy is in 1899, which is due to an extraordinary "Zubusse" for one mine (Friedlicher Nachbar).

Neither dividends nor "Ausbeute," of course, tell the whole story. In prosperous times, good management requires the laying by of reserves and the improvement of the plant. Something of the situation, is revealed by the course of quotation of shares.[1]

[1] Compiled from Saling, 1903–4.

An inspection of the table (p. 261) shows quotations at a relatively high mark in 1889, a mark which was not equalled until 1897, and which was surpassed in only one other year (1899). Shares show a general decline since 1899—a little greater than dividends (17% against 12%), as might be expected with the tendency to discount a relatively unpromising future. The fact that shares advanced from the low point (1892) to the high point (1899) by 111%, while dividends between similar points advanced 160%, seems to show that there was no general attempt to conceal earnings by not dividing profits.

DIVIDED PROFITS AND ASSESSMENTS OF GEWERKSCHAFTEN.

	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902*
Altendorf	.	.	.	.	260	320	320	0	0	0	−200	−250	−300	−400	−600	−600	.	−500
Baaker Mulde	.	.	.	.	.	60	200	0	0	−300	−50	−300	30	20	20	.	.	.
Rosenblumendelle	.	.	.	.	−75	−175	0	−100	−150	−25	−50	−300	−300	−1200	−775	.	.	.
Bickefeld	.	.	.	.	.	0	120	120	0	0	0	−200	−150	−300	−300	.	.	.
Blankenburg	.	.	.	.	75	140	100	100	100	110	100	100	60	50	170	300	.	100
Bommerbanker	.	.	.	.	0	80	240	210	150	120	30	0	−200	−100	−300	60	.	−100
Borussia	.	.	.	.	.	.	.	−300	−200	−300	−300	0	0	0	−300	0	.	120
Caroline	.	.	.	.	0	0	0	0	0	0	0	0	−200	0	0	0	.	80
Carolus Magnus	.	.	.	.	70	140	0	0	0	30	230	325	370	400	450	620	.	465
Charlotte	0	10	0	0	55	180	165	0	0	0	0	50	0	0	0	0	.	.
Constantine d. Gr.	.	.	.	.	360	1000	740	330	190	260	−1185	270	436	600	600	1000	.	900
Dahlhauser	50	100	65	0	50	200	215	0	0	−50	−150	−100	0	0	0	50	.	200
Dorstfeld	.	.	.	.	200	570	550	0	0	0	0	−800	340	120	120	120	.	120
Eiberg	.	.	.	.	105	285	200	0	110	160	200	220	270	300	300	300	.	200
Eintracht	.	.	.	.	190	930	1100	240	0	0	0	0	0	200	380	550	.	350
Ewald	.	.	.	120	150	700	820	760	720	20	720	765	900	900	1200	1200	.	1200
Freie Vogel u Un	.	.	.	.	115	170	150	20	40	50	45	50	0	0	−200	−100	.	.
Friedl. Nachb.	0	0	0	0	0	0	0	−60	0	−65	−250	0	−50	0	−3600	0	.	.
Friedr. d. Gr.	.	.	.	.	290	810	700	510	80	0	240	440	0	0	0	0	.	400
Fohl. Morgensonne	.	.	.	.	500	1200	1400	600	450	400	325	450	525	450	525	700	.	525
Gen. Blumenthal	.	.	.	.	.	245	30	−100	−600	−100	0	50	200	250	600	750	.	900
Graf Bismarck	0	120	200	350	425	1050	1800	1400	1200	1200	1400	2000	2000	2000	2000	2000	.	2800
Graf Schwerin	−400	−300	−250	−150	0	300	400	190	0	0	0	180	0	150	300	400	.	400
Heinrich	60	50	0	0	140	360	450	160	150	130	160	190	80	60	160	350	.	325
Helene u. Amalia	270	255	255	410	610	1570	1370	320	350	450	550	800	1000	1000	1000	1700	.	1000
Hercules	0	0	10	0	0	110	120	20	—	—	70	160	80	—	—	—	.	400
Joh. Deimelsburg	.	.	.		−250	−150	0	0	0	100	150	130	260	300	60	350	.	325
Jul. Phillip	.	.	.	95	270	220	0	0	−100	−250	−250	0	130	170	80	.	.	−700
Kaiser Friedrich	.	.	.	.	0	270	270	55	120	120	120	120	240	300	195	.	.	.

	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902*
Königin Elisabeth	. .	. .	. .	250	500	1300	1200	570	450	450	450	500	600	700	950	1300	. .	1000
König Ludwig . .	. .	.	. .	. .	0	360	360	90	0	—810	80	200	400	400	400	400	. .	400
Langenbrahm . .	150	180	180	210	390	800	800	600	550	300	350	575	800	800	600	600	. .	600
Lothringen . . .	. .	.	. .	. .	120	720	810	230	30	240	0	0	400	400	600	900	. .	1000
Mt. Cenis . . .	—300	—300	0	—500	0	150	200	—300	—400	—300	0	—500	—800	300	620	. .	. .	1095
Pörtingssiepen . .	0	0	15	60	120	240	300	165	120	120	120	120	120	120	120	120	. .	325
Prinz Friedrich .	. .	. .	. .	. .	25	25	20	10	20	0	0	0	0	0	0	0	. .	. .
Richradt	. .	. .	. .	. .		. .	60	93	60	25	30	120	120	120	75	60	. .	. .
Rudolph	30	10	. .	. .	32	185	135	90	25	40	35	105	100	100	20	110	. .	80
Schür. u. Charl. .	. .	. .	0	0	0	75	180	25	0	15	30	90	120	60	75	100	. .	120
Sieben Planeten .	. .	. .	. .	. .	50	280	150	0	0	0	0	60	120	120	120	120	.	. .
Steingatt	. .	. .	. .	. .	30	240	160	0	0	0	0	0	0	—300	—400	—450	. .	—600
Stock u. Scheren. .	. .	. .	. .	. .	. .	120	120	40	10	35	45	80	80	80	40	. .	. .	. .
Trappe	. .	. .	0	0	10	25	105	120	65	90	110	150	200	200	150	270	. .	. .
Tremonia	. .	. .	15	80	60	60	200	30	0	25	125	105	150	170	210	240	. .	. .
Unser Fritz . .	0	—300	100	100	200	850	1200	800	500	575	800	800	800	800	800	1000	. .	1050
Victor	0	0	0	0	50	400	1200	600	280	340	370	600	600	650	500	0	. .	200
Victoria	. .	. .	0	0	0	0	—200	—100	—100	—200	—100	—300	—250	0	0	0	. .	—150
Total	—140	—160	590	1025	5127	16413	27460	7538	4220	3705	4350	2750	9281	9990	6965	14520	. .	14630
Average . .	—10	—11.4	34.7	51.3	125.0	364.8	596.9	160.4	91.7	80.5	92.6	58.5	197.5	217.2	151.4	372.3	. .	430.3

*Last column from *Essen Hk.*, 1902, Th. I. pp. 72–6. Rest from *Dortmunder Jahrb.*, 1901.

	1889	*1890*	*1891*	*1892*	*1893*	*1894*	*1895*	*1896*	*1897*	*1898*	*1899*	*1900*	*1901*	*1902*
Aplerbecker	220.25	210	149	126	112	102.25	139.75	122.25	133.60	132	116	108.25	90.25	90.50
Arenberg	520	532	510	397	427.50	539.80	625	774	810	916.75	1050	576	530	588
Bergb. u. Schiff.	------	------	------	------	------	------	------	------	------	117	118	116.50	117	122
Bochumer Bgw.	149	103.50	44.22	36.25	70.75	83	96.75	81	83	75	33.80	------	------	------
Kölner Bgw.	206	185	157	136	138.40	149.50	172.75	228.50	262.25	283.50	430	372	330	374
Concordia	------	130.60	89	70.50	80.25	115	135.90	238.75	297.50	271	321.75	271	286.75	283
Consolidation	223	191.50	153.50	140	163.10	173.80	204	248.75	290	306.80	402.90	339 75	302.50	353
Gelsenkirchen	219.50	176 50	133 25	127 10	145.50	167	171	170.90	192.10	191	198 25	180.75	170 40	179 90
Harpener	326.90	199.50	142.25	119.20	136.50	146.30	167.80	176.30	194.30	178.60	202.30	168.40	157.40	169 30
Hibernia	244.50	193.75	122	101.80	115.90	136.60	169	180.60	209.70	197.30	221.60	193.20	164.10	178.20
Königsborn	------	------	------	------	------	------	------	130	175	153	179	182	138.50	124.50
König Wilhelm, Pr. A.	16	30	27	10	8	10	10	17	20	20	25	20	20	17
" " St. A.	11	25	22	5	3	5	5	12	15	15	20	15	15	12
Louise Tiefb, Pr. A.	202.90	164	150.10	103	95	87	94	131.75	112 50	107.50	125	118.25	89.50	72
" " Kon. A.	165	127.50	77.99	59	57	------	55.10	98.60	78.25	72.25	82.50	74	49 25	37.50
Magdeburg, St. A.	303	255	248	234	------	250	340.50	410	461	------	474 50	490.50	460	482
Massen	------	97.10	62.75	43	37.25	63.25	68	139.75	134[1]	136[1]	168[1]	[1]147.75	111[1]	107.80[1]
Mülheimer	------	------	------	------	------	------	------	------	------	------	125	101	83	88.75
Nordstern	109	85	46.50	40.50	77.50	113.50	161.90	220.50	221	225	237.75	217	226.25	248
Rhein Anthrac.	------	114	79	77.25	70	69	74.50	138.50	132.50	118	128 80	114	116.10	126.10
Average	208.29	165.88	130.21	107.39	108.60	138.19	158.29	195.51	212 31	206.81	233.00	200.28	181.95	192.82

[1] Junge.

Only with a few mines do reserve funds appear to cut much of a figure; the principal question therefore is, how much has been written off for depreciation, and how far was this in excess of the necessary amount. Satisfactory material on this point covering the accounts of enough mines, over a series of years, to serve as a proof is, unfortunately, not at hand. Effertz in his analysis of the accounts of a large majority of the mines (*circa.*, 80%) for the period 1873–1890, finds an actual average for that period of 1.60%, which he declares to be excessively low, and due simply to the scanty earnings of the industry. He proposes as a modest amount 3%.[1] This would undoubtedly be regarded as rather low. The actual practice of the present day is to give a much more liberal allowance for depreciation. The following table shows what it is in the principal corporations of the Ruhr in 1902:[2]

Company	*Share Capital.*	*Depreciation.*	*Per Cent. of Share Capital.*
	m.	*m.*	
Aplerbecker	2,400,000	239,809	9.1
Arenberg	6,000,000	463,560	7.7
Bergb. u. Schiff.	7,000,000	376,380	5.2
Kölner Bgw.	6,000,000	706,542	10.1
Concordia	8,000,000	494,058	6.2
Consolidation	16,000,000	1,278,670	7.9
König Wilhelm	5,700,000	523,970	9.2
Gelsenkirchen	60,000,000	5,968,528	9.9
Harpener	60,000,000	7,586,536	12.6
Hibernia	39,400,000	3,496,946	8.9
Königsborn	9,000,000	750,000	8.3
Luise Tiefb.	7,722,600	289,921	3.7
Magdeburg	2,100,000	372,171	13.0
Massen	5,500,000	316,030	5.7
Mülheimer	15,000,000	882,914	5.9
Nordstern	20,000,000	1,786,281	8.9
Rhein. Anthrac.	3,900,000	176,007	4.5
Average			7.3

[1] Effertz, (1891), pp. 12–13.

[2] Compiled from Saling, 1903–4.

The amounts written off for depreciation here, though high in individual cases, do not seem excessively high on the average.[1]

The material respecting Upper Silesia is so scanty that it would be useless to attempt an analysis of the situation. It must suffice to give the proceeds per ton of the district, together with proceeds per ton of those mines belonging to the convention, and the fiscal mine Königin Luise.[2]

	Proceeds per ton		
Year.	*Upper Silesia.*	*Convention.*	*Königin Luise.*
1887	3.79	—	—
1888	3.78	—	—
1889	3.92	—	—
1890	5.04	4.78	—
1891	5.68	5.47	—
1892	5.70	5.54	—
1893	5.63	5.50	6.20
1894	5.48	5.38	6.15
1895	5.47	5.39	6.06
1896	5.47	5.35	6.23
1897	5.59	5.42	6.45
1898	5.88	5.70	6.76
1899	6.28	6.12	7.41
1900	7.48	7.39	8.30
1901	8.45	8.43	9.04
1902	8.03	7.98	—

The proceeds are much less than in the Ruhr, but the coal is of an inferior quality, and it has not so good a market. The costs are said to be 25% less than the Ruhr,[3] but no exact information apart from a few mines is available.

[1] They were probably somewhat higher in 1900 and 1901. Pieper says that a number of prominent mines wrote off 32,000,000 m. in 1901, which was equivalent to 9½% of their investment. Pieper, p. 106.

[2] Enquete, pp. 558, 279.

[3] Reichstag, 1902, p. 6119.

Profits in the Saar appear to have been much greater than in the Ruhr.[1]

(1)	(2)	(3)	(4)	(5)
Year.	*Cost of production per ton.* m.	*Proceeds per ton.* m.	*Net proceeds per ton.* m.	*Estimated per cent profit.* m.
1893	7.29	8.94	1.65	10.1
1894	7.13	8.81	1.68	10.3
1895	6.94	8.90	1.96	12.0
1896	6.85	8.94	2.09	12.8
1897	6.87	9.28	2.41	14.8
1898	7.14	9.53	2.39	14.0
1899	7.51	10.35	2.84	17.4
1900	7.00	11.99	4.99	30.6

[1] Column (2) from Laur, II, p. 130; (3) from Enquete, p. 279; (4) calculated from (2) and (3); (5) calculated on capital investment of 16.32 m. per ton (same as Ruhr, see p. 254.)

In considering the reasonableness of coke prices, we have by no means such adequate criteria as for coal. The coke producers are almost all coal producers, and the lesser account is swallowed up in the larger, so that a comparison on the basis of earnings or dividends etc., is impossible. The only remaining test is a comparison of proceeds and costs. We have examined the problem of cost elsewhere, and it has been made clear that the uncertainty as to how much should be set down for the principal element, *i.e.*, coal, makes anything more than a rough approximation highly arbitrary. In making a comparison of the price policy of the Ruhr and the Saar (see p. 197) a table of average proceeds per ton for coke in the Ruhr has been given already. Those figures were obtained from the reports of the coke syndicate giving the total production and total estimated value of the production of the region. The quotient of these two figures gives the annual average proceeds for the syndicate.[1] As a check, however, on these figures the

[1] As may be seen by comparing the figures so obtained for 1900, 1901 and 1902 with those given in Enquete, p. 792.

following table has been compiled from data given in the *Dortmunder Jahrbuch*, 1901, for individual mines.[1] Considering that only 5 to 15 concerns are represented, while the syndicate includes 44, the results are fairly close.

	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Dannenbaum	14.82	16.82	12.29	9.95	8.75	8.93	9.94	10.59	12.31	13.48	15.08
Concordia	-----	-----	-----	-----	-----	8.45	9.16	9.76	10.90	12.93	13.52
Dorstfeld	12.47	16.73	12.53	10.26	8.32	8.28	8.77	9.52	10.79	12.53	13.08
Louise Tiefb.	-----	-----	-----	-----	8.43	8.26	9.29	10.06	11.83	12.96	14.70
Bruchstrasse	-----	-----	-----	-----	8.22	8.33	9.17	10.01	11.60	12.79	14.39
Eintracht Tiefb.	-----	-----	-----	-----	-----	-----	8.84	9.58	10.62	12.55	12.93
Friedr. Ernestine	-----	-----	-----	10.28	10.40	10.37	10.52	9.97	11.39	13.23	13.25
Graf Beust	-----	-----	-----	-----	-----	-----	9.05	10.05	10.91	12.98	13.35
Graf Schwerin	-----	-----	-----	-----	-----	-----	-----	9.55	10.59	12.51	12.94
Harpener	-----	-----	11.17	9.10	8.17	8.37	9.31	10.08	11.77	12.92	14.48
Helene u. Amalia	-----	-----	-----	-----	8.47	8.24	8.78	9.53	10.87	12.69	13.06
Julius Phillip	-----	-----	-----	-----	-----	-----	9.27	10.03	11.64	12.81	13.83
König Ludwig	12.16	16.86	12.18	10.20	8.51	8.49	8.92	9.73	10.73	12.75	13.06
Königsborn	11.40	20.74	12.70	10.31	8.58	8.33	8.88	9.71	10.80	12.65	13.09
Lothringen	10.18	18.37	12.97	10.25	8.45	8.22	8.29	9.61	10.63	12.66	13.06
	12.21	17.90	12.31	10.05	8.63	8.57	9.16	9.85	11.16	12.83	13.69

When we attempt to compare these syndicate proceeds with the cost of coke, we are met by the difficulty

[1] *Dortmunder Jahrbuch*, 1901.

already considered in the discussion on page 173, namely, what is the cost of coking-coal? If we should assume the average cost of coal as the basis, we should find that coke was sold at a loss of 1.47 m. in 1894, and below cost between 1892–1896 inclusive. The business, however, was not considered unprofitable at that time. In 1894, the Bochum Handelskammer describes the coke situation as tolerable,[1] and in 1896 as good.[2] The report of the coke syndicate for 1895 describes the market as satisfactory.[3] The relation of the average cost of coal and the proceeds for coke are shown in the following table:

Year.	*Average cost of coal.*	*Corresponding cost of coke.*	*Average proceeds Coke syndicate.*	*Differences.*
1889	5.47	8.94	—	—
1890	7.98	12.53	—	—
1891	8.38	13.10	13.11	+ .01
1892	7.38	11.67	10.86	− .81
1893	6.42	10.30	8.99	−1.31
1894	6.38	10.24	8 77	−1.47
1895	6.66	10.58	9.35	−1.23
1896	6.77	10.80	10.10	− .70
1897	7.04	11.19	11.60	+ .41
1898	7.32	11.58	13.02	+1.44
1899	7.66	12.07	13.29	+1.22
1900	8.54	13.33	16.59	+3.26
1901	8.77	13.66	18.00	+4.34
1902	8.39	13.18	15.28	+2.10

Comparing these statements with the calculation of the cost of coke, on the assumed basis of average coal cost, it may be reckoned that in 1894, for example, the cost of coal should have been taken 17% lower, if cost and price were to balance, and in 1895, it should have been 13% lower. It is certainly not unreasonable to suppose that the actual cost of coke-coal may be taken generally as not greater than the average cost of coal. With a relatively weak demand it may be sold below

[1] *Bochum Hk.*, 1894, p. 5.

[2] *Id.*, 1896, p. 7.

[3] Report of coke syndicate, as given in *Bochum Hk.*, 1895, p. 9.

the average cost (or transformed to coke by the mine on an assumed value below average cost), while with a vigorous demand it may be advanced to a much greater sum according to what the market will bear. But, in estimating the reasonableness of coke prices, we may assume as a *maximum basis* of cost the average cost of coal. Applying this test to the years 1900 and 1901, we have evidence of the enormous profits of coke manufacture in those years—*viz.*, 3.26 and 4.34 m. per ton net proceeds. That profits were enormous may be readily seen by considering the small amount of capital required for a coke plant. The annual report of the mine "Consolidation," for 1902, put the value of its 150 ordinary ovens[1] at 30,926 m.,[2] and the 132 by-product ovens[3] at 767,769 m.[4] This would give a book value of about 206 m. per ordinary oven, and about 5816 m. per by-product oven. The book values are not, of course, entirely trustworthy, but they are approximate. The output of "Consolidation" was 242,473 tons.[5] With a coke price of 15 m., a cost of coke coal of 7 m., and labor in coking at 1.20 m. per ton, the net profit would be, it seems, over 600,000 m., or over 80% of the value of the plant, (without taking account of the revenue or plant of the by-product business). This is intended only as rough approximation. It may be tested by entirely independent data as follows. The cost of an Otto by-product oven (common in the Ruhr) is given as between 7,000 and 7,500 francs,[6] say 6,000 marks. The output

[1] Steinkohlenzechen, p. 62.

[2] Saling, 1903–4.

[3] Steinkohlenzechen, p. 62.

[4] Saling, 1903–4.

[5] Enquete, p. 791.

[6] *Bulletin Trimestriel de la Société de l'Industrie Minérale*, 1903, p. 794. This is without the by-product accessories which require in addition about 11,000 to 12,000 francs.

of these ovens ranges, generally from 1,000 to 1,250 t.[1] Taking an average of 1,125 tons, a coke price of 15 m., a coking-coal price of 7 m., and a labor cost per ton of coke of 1.20 m,, the net receipts would be about 110%. Here again the by-product plants are left out of account, which, though they greatly increase the revenue,[2] also add largely to the capital cost.

The gross returns of the ordinary ovens are much smaller than than those of the by-product ovens, but the net return is unquestionably much larger, at least whenever the price of coke rises much above the cost of making it. Graf Kanitz cites an expert estimate for the capital element of cost as .80 per ton.[3] This was for an ordinary oven. Even assuming that the cost of coking coal should be taken as high as average cost, and taking the net proceeds on that basis as 3.26 m. and 4.34 m. for 1900 and 1901 respectively,[4] and the return on the capital investment as .80 m., the percentage of profit would be over 400 and 500 per cent. respectively, for the ordinary ovens. For the by-product ovens, the profits would be positively greater, though giving a smaller percentage return on capital. On these same assumptions coke production would give heavy losses for the period 1892–6, which does not seem to have been the point of view of the producers themselves at that time. If, therefore, we should assume that those years were profitable, and apply the same scale of cost to 1900 and 1901, the profits for those two years would be even greater. All such calculations, however, are more or less arbitrary, and the only solid fact seems to be that coke production furnished an inordinate profit in 1900–1.

[1] Enquete, p. 618.
[2] See p. 174.
[3] Kanitz, p. 11.
[4] See p. 266.

CHAPTER VIII

ORGANIZATION OF SALE AND THE COAL TRADE

From the general economic standpoint, the two chief functions of the cartells are the regulation of production and prices. Subsidiary to these, but connected intimately with them, is the regulation of the coal trade.

The coal *syndicate*, technically, is an organ established to control the sale of coal, not prices or production, for in these last two matters it is subordinate to the assembly of mine owners. The administration of the sale of coal, however, with a few trifling exceptions is in the hands of the syndicate.[1] The situation with respect to the coke cartell in substantially the same.[2] The convention in Silesia, on the other hand, maintains a quite different system; the sale of the commodity is left absolutely to the individual producers.[3] The regulation respecting the minimum price brings about a certain similarity of policy, however, and the individual members have put a large part of the sale into the hands of two coal dealers who are members of the Convention.

The most important question concerning the selling policy of the coal cartells is that of price discrimination to different classes of customers. This may be established directly, or indirectly, by compelling purchasers to buy of middlemen. In the Ruhr coal trade the lowest prices, namely, the regular syndicate prices are given to the large individual consumers whose annual orders are at least 6,000 t.[4] About 55% of the

[1] *Cf.*, p. 82, *supra*.

[2] *Cf.*, p. 86, *supra*.

[3] *Cf.*, p. 106, *supra*.

[4] Enquete, p. 141.

total amount of coal is sold directly to the consumer,[1] and most of this is at regular syndicate prices. A similar discrimination exists in the coke syndicate; direct sale at syndicate prices is made to purchasers of 100 to 150 tons or more per month, semi-annually.[2] From the point of view of the convention, this question cannot arise, because only the minimum price is fixed. This minimum price does not apply to the local smelting industry,[3] which may operate as a favorable discrimination. Preferential treatment may be granted by the individual sellers, and, as a matter of fact, it exists for large consumers.

The large purchasers of coal (6,000 t. or more per year), who buy directly of the Ruhr syndicate, including industrial consumers and wholesalers, get the syndicate prices, without preference. Certain consumers who purchase less than that amount, who were favored customers of the mines before the syndicate was formed, are given the same privilege, but the syndicate refrains from adding to the list.[4] The situation in the coke syndicate is the same, without the exceptions.[5] In Upper Silesia the wholesale trade is specially favored. The two great coal dealers of that district, Wollheim & Co., and Friedländer & Co., are themselves members of the convention. Friedländer, as the owner of the Emmagrube, is represented again as a regular mine-owner.[6] Both these dealers have large interests in coal properties, and, besides that, practically control the coal trade as consignees of about

[1] Denkschrift, p. 10.

[2] Enquete, pp. 687, 705.

[3] *Cf.*, p. 106, *supra*.

[4] Enquete, pp. 141–2; Denkschrift, p. 10.

[5] Enquete, p. 687.

[6] Enquete, p. 555; *Stat. Oberschl. B.-u. H.*, 1902, p. 24.

60% of the main line shipments.[1] Their price arrangements are not public, but probably they are as well treated by the convention as by the fiscus of Upper Silesia, which, for a minimum annual order of 50,000 t., gives them a 40 pf. rebate, on condition that they do not sell above the public mine price.[2] The general price system of the Silesian fiscus is regulated on the basis of the day price at the mine as follows,[3]

Am't of purchase.	*Rebate (M.)*
1,000– 3,000 tons	.10
3,000–25,000 "	.20
25,000–50,000 "	.30
Over 50,000 "	.40

The small consumers in the Ruhr are discriminated against by being excluded from direct purchase. In the case of the selling agencies of the coal and coke syndicates, the syndicates themselves make a price discrimination on quantity. Another form of price discrimination is in the preferential rates given to exclusive customers. They must agree neither to buy nor sell the coal of any non-syndicate mine *of the Ruhr district* under penalty of an additional price of 50 pf. per ton on their contracts.[4] The penalty does not apply to the purchase or sale, for example, of English coal.[5] A similar condition prevails in the coke syndicate, covering coal, coke and brikets, with a penalty of one mark.[6]

Control of the coal trade is also sought by other regulations in the contracts of sale. From the technical standpoint of production, coal mining is not a

[1] Enquete, p. 346.

[2] X Commission, p. 14.

[3] *Glückauf*, 1900, p. 786

[4] *Cf.* contract forms, Enquete, pp. 299, 301, 302, etc.

[5] Enquete, pp. 160–1.

[6] *Id.*, pp. 685–6.

seasonal industry, though the demand increases in the winter. Contracts, however, for commodities that are used continuously often tend to be made for fixed terms for the convenience of both producer and consumer. The question how long the term shall be is by no means a matter of indifference to either of them. For the coal producer, long term contracts for a large part of the output give a surer basis for economical operation, both technically and commercially, though he must save himself from liability in case of accidental interruptions. For the consumer, it has the advantage likewise of giving a greater security in supply and a better guarantee of uniformity in quality. Under stable conditions of industry, with respect to production and prices, a system of long-time contracts would have considerable advantages. The bad side of the system is seen in periods of rapid change, when contracts concluded at low prices result in large unearned gains to the purchasers, as compared with competitors who bought after the price had advanced, and, *vice versa*, contracts concluded at high prices involve undeserved losses when the *conjunctur* suddenly changes and prices fall.

At the present day in the Ruhr, the large majority of the contracts are made for a year. In the early seventies, monthly contracts were common with great price variations.[1] The historical practice, on the whole, however, has been contracts for a year, with exceptions in hard times (*e. g.*, 1893).[2] Yearly contracts prevail generally also in Upper Silesia, though each member of the convention is free to do as he pleases, and sometimes shorter terms are found.[3] In the coke syndicate, on the other hand, the practice of semi-annual con-

[1] Enquete, p. 108.

[2] *Id.*, pp. 105, 114.

[3] *Id.*, pp. 119, 341–3, 352.

tracts has been common, although the usual period is a year.[1] The so-called "fusion two year contracts" made in 1899 for 1900–1 were an extraordinary and undesirable exception.[2]

Considerable complaint has been made against annual contracts as unduly long.[3] These complaints became conspicuous since the beginning of the present depression, when the payment of high coal prices, agreed to before the crisis, was found very burdensome. Nothing was said, of course, about the previous *hausse* period when consumers had made gains by the same system. The cartell leaders, however, defend the annual contract system.[4] Little justification could be offered for two-year fusion contracts of the coke syndicate, but it found at least one defender among the consumers.[5] The chairman of the coal syndicate tried to extenuate the injury which had been caused, by arguing that without the two-year treaty the prices would have gone up much higher.[6] The trouble with his defense is that it is not so much a question whether prices would not have gone higher in 1900, as whether they would not have fallen lower in 1901. The means, also, by which these contracts were imposed upon iron producers, by a more or less covert threat that they would not otherwise obtain the needful supply, would be still harder to justify.[7]

In the contracts of the sale of coal, a clause is generally inserted, providing for the deposit of cash or collateral security for the payment of the same.[8] This has

[1] *Id.*, pp. 687, 689, 705.

[2] *Cf. supra*, p. 64.

[3] Enquete, pp. 111, 115, 163, 459, etc.

[4] *Id.*, p. 114.

[5] Kirdorf-Rote Erde, Enquete, p. 647.

[6] Kirdorf-Gelsenkirchen, Enquete, pp. 664–5.

[7] Enquete, pp. 647, 661; *Cent. Verband D. I.*, 1901, p. 238.

[8] *Cf.* contract forms, Enquete, Anlage, VI, pp. 285, *et seq.*

been customary since the beginning of the syndicate, though the requirement does not seem to have been enforced, except from coal dealers, or parties whose credit with the syndicate was not good.[1] The same requirement has been made by the coke syndicate.[2] Some complaint has been made of these requirements and in respect to discrimination in their enforcement, but the matter does not seem to have constituted a real abuse.[3] Another clause in the coal contracts that merits attention is that placing limitations on the free disposition of the coal by the purchaser. A penalty clause is inserted for all sales to parties reserved for the direct trade of the syndicate, or its selling agencies. The contract provisions of this sort for the industrial purchaser contain the provision that re-sale to railways, gas works, brick works or lime-kilns, or any reshipment from the original point of destination, shall be penalized by an addition of 3 m. per ton to the selling price.[4]

The contracts also contain provisions releasing the seller, wholly or partially, from the fulfilment of the same. A clause is generally inserted concerning the interruption of shipments on account of lack of water, and their subsequent dispatch. Another clause contains the provision that, if the purchaser does not take the coal contracted for according to the quantities and at the dates stipulated (excepting cases of interruption of transportation, not due to the fault of the purchaser), the syndicate shall have the right to reduce subsequent shipments. Another common clause has been subject to much criticism. An example reads as follows: "Essential interruptions of production, strikes, whether the same are

[1] Enquete, pp. 158, 222.

[2] *Id.*, pp. 695, 698.

[3] *Cf.* Enquete, pp. 695, 698.

[4] *Cf.* contract form, Enquete, p. 300.

caused by breach of contract or by notice of laborers, superior power (*höhere Gewalt*) of every kind, including mobilization and war, justify us for the duration and extent of the disturbance in the production and shipment to reduce the supply *pro rata* for the omissions caused thereby. These omissions will be supplied later."[1] The provision in the contracts of the coke syncate, that quantities not delivered on time on account of interruptions of operation must be taken later, is characterized by Herr Kirdorf, as a "very gross mistake."[2]

Without going into further detail, it may be stated that these various provisions of the contracts have called forth lively criticism from the coal and coke purchasers as one-sided and unfair.[3] On the other hand, some coke consumers have admitted that they have been treated generously in the matter of postponing deliveries until the coke was needed.[3] One of the iron producers claimed that it was not possible in making a contract for a whole year to figure the need precisely, and therefore the coke syndicate should allow a little latitude in the fulfilment of the purchase.

Of peculiar interest is the above stated clause of the contract which excuses the coal producers from fulfilling their obligation in the case of interruptions through strikes. This exists both in the Ruhr and in Silesia.[5] It has been insinuated that advantage has been taken of this clause to provoke strikes, where it was desired to be relieved from the duty of furnishing the agreed supply.[6] It first appeared in private contracts in 1889.[7]

[1] Enquete, p. 301.
[2] *Cent. Verband D. I.*, 1901, pp. 36, 39.
[3] *Cf.* Enquete, pp. 221–2, 693–4, 702, etc.
[4] *Id.*, pp. 661, 682.
[5] *Id.*, p. 535.
[6] *Id.*, pp. 250, 534–5.
[7] *Id.*, p. 252.

In concluding this topic, it may be observed that the contracts of the fiscal works are even stricter.[1]

The organization of the sale of coal, coke, etc., is not limited to the central selling agency of the coal syndicate; in its wider development, it enters into the field of the dealers. In the central bureau there are four departments, each covering a certain territory. Besides these, there is a special selling agency at Düsseldorf, which is given orders for that city and neighborhood which do not exceed 6,000 t. per annum.[2] It is stated that the gross profit allowed to this branch is as follows:[3]

For lots up to	59	cars (10 tons)	8	marks	per	ton.
"	"	119	"	"	7	"	"
"	"	236	"	"	6	"	"
"	"	359	"	"	5	"	"
"	"	479	"	"	4	"	"
"	"	600	"	"	4	"	"

This is said to be greater than was allowed to the dealers before its establishment.[4] The local dealers find themselves seriously injured by this invasion of their territory. Still another step has been taken by the syndicate, which may be considered as the beginning of an organization intended ultimately to control a large part of the coal trade. The wholesale dealers in certain districts have been amalgamated, under pressure from the syndicate, and, to the companies so formed, the syndicate refers all orders for coal which do not exceed 6,000 t. per annum. In a recent trade annual, six of these companies are given, located in Dortmund, Bremen, Cassel, Hannover, Magdeburg and Utrecht (Holland),[5] which have the sale of coal and

[1] Enquete, pp., 227–8.

[2] *Id.*, p. 29; *Dortmunder Jahrb.*, 1901, p. 543.

[3] *Id.*, p. 514.

[4] *Id.*, p. 512.

[5] Steinkohlenzechen, pp. 96–8.

coke. The exact field of each company is strictly defined. The reason for the formation of these companies was to promote the sale of syndicate coal, especially in the competitive or "disputed" regions, through a strong organization. They are given a monopoly of syndicate coal for six months, and, provided they are reasonable, they can charge what prices they please.[1] The syndicate has a constant and complete check on all their actions, through the councils (Aufsichtsräte) of the companies, in which one of the Vorstand of the syndicate is always a member. If they abuse their privilege, their monopoly, Herr Kirdorf says, would be withdrawn.[2] It is against the policy of the syndicate to admit new members to these organizations, as long as the present ones suffice.[3] It is also claimed that this system is necessary in order to control the dealers of the second rank—small wholesalers.[4] This establishment of a dealer's *rayon* has been denounced by the opponents of the cartells, but it has been defended, on the other hand, as commercially advantageous.[5] We have already noted elsewhere the organization by the syndicate of a cartell of dealers (Kohlenhandel Kontor) for the control of the Rhine shipping trade.[6]

Such organizations of trade would be technically impossible in Upper Silesia, under the convention, but the *de facto* position of Wollheim and Friedländer, in some respects, has a strong resemblance thereto. These two

[1] Enquete, p. 241.

[2] *Cent. Verband D. I.*, 1901, p. 243.

[3] Enquete, p. 241.

[4] *Id.*, p. 77.

[5] *Cf.* Reichstag, 1900, pp. 275, 282; Sarter, p. 39.

[6] *Cf.*, p. 103, *supra*.

dealers are said to have long term contracts for the sale of a considerable portion of the coal of the district.[1]

Loud complaints are made by the Handelskammer in Saarbrücken over a somewhat analogous arrangement of the fiscus of the Saar with two favored local merchants, who are given an absolute monopoly of the export business. This is a matter of special envy, because the commission allowed is much larger than for the domestic business (5 instead of 3 marks). The fiscus forbids purchasers to sell to iron works without permission, and dealers who buy of the fiscus are not permitted (practically) to buy any coal elsewhere.[2]

In regard to the relations of the producers to the middlemen, some reformers have favored a commission system throughout the country, in order to prevent dealers from exploiting the consumers. The coal producers, however, seem to think generally that this is not practicable.[3]

Whether the intervention of the syndicate in the coal trade is to be commended or condemned depends a good deal of course, on the conduct of the dealers. The trader or middleman is a favorite object of attack at all times and in all places, and too frequently the useful character of his operations is ignored. The policy of the syndicate in extending its control in this direction was favored by the bad methods of the dealers, and the hostility they excited by running up prices during the coal famine of 1900. That the prices exacted were extortionate was apparent, though just what is a fair price at retail is not so clear. Some data on this point, however, make a more intelligent comparison possible. In testimony before the Coal Commission in 1901, the large

[1] Sayous, p. 104.

[2] *Frankfurter Ztg.*, Oct. 26, 1903.

[3] Denkschrift, pp. 17–18; *Industrie Ztg.*, 1900, pp. 227–8.

Silesian dealers, Wollheim & Co., gave the difference between the wholesale and retail charges in Berlin, at a reasonable profit of 5 to 10%, as about 8 m. per ton.[1] Reckoned from the local wholesale price, this gives an advance of 35%. A Hamburg merchant declared in the Enquete that with a normal *en gros* price for screened nut coal of 1.95 m. per hectolitre, the value delivered at the house was at that time 2.70 m. This gives an advance of 42%; this same merchant says that an advance of 50% gives about 10% profit.[2] In the summer of 1903 the prices of Nusskohle in Berlin stood as follows,[3]

	Per ton.
Local wholesale	21.50–22.00 M.
Retail (per dz., 2.60)	26.00 "
Petty retail (per 50 kg., 1.36)	27.20 "

The retail prices here show an advance of 18 and 24% respectively, but it is only just to state that at that time competition was severe and the market unfavorable, and the dealers claimed there was no profit.[4] Probably an advance of 6 m. gives a fair profit in general.

Complaint of the prices of coal dealers does not appear to have been very extensive before the recent coal famine, but at that time they abandoned all restraints of moderation, and exploited the situation for all it was

[1] X Commission, p. 4. In more detail the figures are:

Cost of coal at the mine	12.00 to 12.20 m.
Railway freight to Berlin	10.60 to 11.00 "
Transfer to warehouse	1.50 "
Cost of storage	.60 "
Screening	1.40 "
Loading and carting	2.30 "
Waste	1.00 "
General expenses and taxes	1.40 "
Retail price	31.40 "

[2] Enquete, p. 455.

[3] *Zeitschrift f. Braunkohlen*, 1903, p. 230.

[4] Enquete, p. 508.

worth. An investigation, instituted by the chambers of commerce of Westphalia, showed it to be almost universal in that region;[1] the Coal Commission of 1901 bears witness to the same fact for Prussia in general;[2] the same testimony comes from Silesia, Hessen, Holstein, Bavaria, Saxony, etc.[3] The syndicate dealers were also inculpated in some instances.[4] It was quite common, in these cases, to find the prices doubled. The same, or even worse, was true for coke.[5] The syndicate made efforts to prevent extortion, and severed relations with two dealers in consequence;[6] it also discharged some officials of the syndicate, who had been in collusion with the dealers in these practices.[7]

These excesses on the part of the dealers, gave the coal syndicate a ground or excuse to extend its influence and control still further into the sphere of the coal trade. The principal result was the incorporation of a new clause in the contracts of sale to dealers which reads as follows: "You bind yourself in the further sale of this quantity to so measure the selling price that the height of the profit shall not stand in an improper relation to your activity and risk under the circumstances. If you, or those who purchase from you, act contrary thereto, then you must pay to us for every ton sold at an excessive price a fine of ten marks. Furthermore, we are justified without further ado in withdrawing from all contracts of sale and supply existing between us. As to whether a case of excessive profit occurs, the cham-

[1] *Cf. Industrie Ztg.*, 1900, p. 525.

[2] X Commission, p. 18.

[3] *Oppeln Hk*, 1900, p. 17; *Mittelfranken Hk.*, 1900, pp. 137-8; Enquete, pp. 210, 433; Calwer, 1900, p. 89, etc.

[4] *Cf.* Enquete, p. 370, Mecklenburg.

[5] *Cf.* Berlin prices, *Aeltesten*, 1900, p. 13.

[6] Sayous, p. 160.

[7] Reichstag, 1900, p. 295; *Cent. Verband D. I.*, 1901, p. 277.

ber of commerce of Essen, or a committee chosen by it for this purpose, shall decide to the exclusion of regular judicial determination."[1] This clause was first introduced in 1901. Graf Kanitz ridiculed the chamber of commerce of Essen as an arbitration court in such a matter,[2] which indignantly protested against the aspersions cast on its impartiality.[3] It has had no opportunity to act, though the syndicate has terminated relations with some dealers.[4] A similar control is exercised by the coke syndicate. Although complaints of the extortion of dealers were rife in 1898, the coke syndicate did not take action for about a year, when two means of preventing excesses were adopted. The first was increasing temporarily the opportunities for direct purchase in smaller quantities than regularly permitted.[5] The second measure was the introduction of a clause in the contracts of sale to dealers, whereby the latter agreed to limit their advances to 50 pf. per ton for lots over 500 t., and to 1 m. per ton for lots under 500 t. per year.[6] These regulations in the contracts respecting prices, both for coal and coke, place a restraint on *high* prices only. The dealers declare that it is even more in the interest of business that a minimum price limit should be fixed. They have pointed out that the fiscus in the Saar makes such agreements, and that the brown coal cartell of Cologne has established a minimum price for dealers.[7] In Silesia no attempt has been made in the direction of control of the coal trade for obvious reasons.

[1] *Cf.* contracts in Enquete, pp. 290, 295–6, 298, etc.

[2] Reichstag, 1900, p. 296.

[3] *Essen Hk.*, 1900, p. 9.

[4] Enquete, pp. 149–151.

[5] *Id.*, p. 688.

[6] *Id.*, pp. 689–90.

[7] *Id.*, pp. 222, 224.

The dealers are pretty generally against price restrictions in the contracts from motives of personal pride, as well as on economic grounds, but at least one defends it.[1] Herr Kirdorf himself thinks it will prove impracticable in execution.[2] The remarkable change which this and the other measures described above have wrought in the position of the dealer is stated by a Düsseldorf wholesaler as follows:

"If I say that we are not really merchants any more, I prove it as follows. The coal syndicate prescribes to us, first, what sorts we buy, second at what prices we buy them, third, the district of sale whence we may sell, fourth, the selling price at which we may sell. There naturally remains little of the freedom of trade. But I believe that the coal syndicate, according to the circumstances, cannot do otherwise. I do not complain of it, I only say in the future we large merchants must come to a clear understanding that it cannot be otherwise, and that we must become gradually less important. This fact is true to such an extent to-day that it is impossible to begin a wholesale trade on a large scale at all, because the quantities of coal for the same are not available. Moreover the present business is limited to such a degree that it is absolutely impossible to develop oneself."[3]

As another wholesaler expressed it, the dealers have become agents of the syndicate.[4] Herr Kirdorf explains the necessity of the situation as follows: The coal trade was overdeveloped, and the syndicate has been compelled to cut it down, but not without regard to the "existences" concerned.[5]

[1] *Cf.* Enquete, pp. 200, 218–220, 224, 229–233.
[2] *Cent. Verband D. I.*, 1901, p. 243.
[3] Enquete, pp. 230–1.
[4] *Id.*, p. 235.
[5] *Id.*, p. 235.

Consumers' Associations.—Even more significant in some respects, than the relations of the cartells to the dealers, are their relations to the consumers' associations. This interest and significance lies more in their latent possibilities and future than in their present importance. The consumers' association may be regarded as the anti-cartell, or rather it is the consumers' cartell. The history and meaning of these societies in Germany has been made the subject of an interesting monograph by Dr. Riehn. He gives a statistical view of their growth in the following table :[1]

	1864.	*1900.*
Number of associations	38	568
Members	7,700	522,000
Turn-over	800,000 m.	126,900,000 m.
Assets	79,000 m.	15,700,000 m.

Dr. Riehn believes them to be a necessary development of our modern economic system, wherein the trader and consumer are in danger of undue exploitation from the cartelled producers.[2]

" There remains open, therefore, to the consumer only the way of self-help, if he would protect his interests against the producer. From him must be exerted a counter pressure against all those members in the system of the production and distribution of goods which have passed along the pressure from the producer to him. * * * * Against the previous system of anarchy in production the cartell signifies just what the consumers' associations signify for consumption."[3] It is from this point of view that the question of the relations of the consumers' associations to the coal cartell should be considered.

Consumers' associations are formed for the purchase

[1] Riehn : Das Konsumvereinswesen in Deutschland, p. 19.

[2] *Ib.*, pp. 44–57.

[3] *Ib.*, pp. 59, 60.

of particular articles and for consumption in general. There are a good many important coal buying associations,[1] but in most general buying associations, coal is one of the important articles of purchase. Some of these associations are agricultural, some are industrial, while others include all kinds of persons, officials, peasants, laborers, etc.[2] In the region along the Rhine, for example, especially in Hessen-Nassau and the Grand Duchy of Hessen, it is said that there are such associations in every town, large and small, and these are united together in a general association.[3] Some of them are financially strong, others are not. The conditions of demand naturally vary also, according to the character of the membership—industrial or agricultural, etc.

These associations endeavor, of course, as far as possible, to do away with the dealer by purchasing directly from the producers. In the case of coal, they desire to buy directly from the syndicate, the convention mines or the fiscal administration, as the case may be. The coal cartells have been to a certain extent a cause for the formation of these associations, as a sort of anti-cartell,[4] but these organizations would have been formed in any case. The association movement among consumers has a foundation independent of combinations among producers, viz., economy of wholesale purchase, although such combinations may accelerate their growth. Though the consumers' association are to a certain extent anti-cartell, this is to be understood rather in the sense of counter-weight than of enmity. In fact, they frequently justify the cartells, and say

[1] *Cf.*, Enquete, pp. 127, 135.
[2] *Id.*, pp. 135, 211.
[3] *Id.*, pp. 210.
[4] *Id.*, p. 127.

that they are themselves cartells, or that the syndicate is a "Genossenschaft".[1] They feel, however, that this fraternal sentiment is not shared by the coal cartells, and that, in fact, the refusal of the syndicates to treat with them is due to the desire to prevent the formation of a "Gegencartell".[2] The attitude of the syndicate has been openly hostile. In the recent Enquete, Herr Kirdorf declared that it was impracticable to deal with them directly. Herr Unckell openly advised them that they could not hope for it. The representatives of the associations made such a strong showing however, that Herr Kirdorf afterwards adopted a very conciliatory tone, and declared that the matter ought to receive particular consideration.[3] They have received favorable consideration from the government,[4] but the practical experience of the fiscus led the Prussian Minister of Trade and Industry to put their commercial responsibility in question.[5] The consumers' associations themselves, on the whole, find their dealings with the fiscus, whether in the Saar or in Upper Silesia, of a satisfactory character.[6] In 1900, it appears that the fiscus of Upper Silesia sold 95,000 t. to such associations, and the *état* for 1901 proposed an extension of such sales to 367,000 t.[7] The "suffering" agricultural industry in Germany has always received particular consideration from the administration.

The stiff attitude of the syndicate on the other hand

[1] Enquete, pp. 403, 406, 413.

[2] *Id.*, p. 137.

[3] *Id.*, pp. 236, 413, 744.

[4] Reichstag, 1900, p. 282 (Brefeld); X Commission, pp. 26–7; Abgeordenten, 1900, p. 935

[5] Reichstag, 1900, p. 282 (Brefeld). Abgeordenten, 1900, p. 847 (Brefeld).

[6] Enquete, 407, 432.

[7] X Commission, 12.

has been softened by no particular sympathy for the agricultural interest, which, so far as the business side of the question is concerned, after all has a relatively small consumption. The real reasons for its attitude are commercial, which are justified as follows: (1) that the associations are not financially reliable, (2) that they engage in trade, (3) that their consumption is fluctuating, either (a) on account of the fluctuating character of their wants, or (b) because they cannot keep the custom of their members whenever coal is offered at a lower price elsewhere, (4) the impracticability of administration for such customers, (5) necessity of defending interests of dealers who cannot be entirely dispensed with.

To the objections made by the syndicate that the associations are not financially reliable, the latter protest, and in some cases offer to give any reasonable guarantee.[1] It seems here, as in most other points made against the associations, that there are strong and weak, good and bad. The syndicate has simply refused to give them a fair trial. The charge that they trade[2] seems to be justified in some cases, though in others it seems to be a consequence of confusing their sale to affiliated societies with general selling.[3] The "Hauptgenossenschaft zu Berlin" gave up the special privileges accorded to it by the fiscus in order to be able to sell to non-members.[4] Capable of more definite proof is the charge that they do not take their supplies in regular quantities. This is a matter of real importance to the coal companies on account of expense of storage, difficulties in sending out cars, etc. The coal producers and dealers furnish a

[1] Enquete, pp. 135, 215, 409, 428, 449.

[2] *Id.*, pp. 414, 422, 743.

[3] *Id.*, p. 437.

[4] Abgeordenten, 1900, pp. 934–5.

good deal of statistical illustration of this irregularity.[1] Herr Williger (head of the convention) gives an instance of the purchases of the Ostpreussische Feuerungsmaterial-Einkaufsgenossenschaft in Königsberg. They bought 9300 Zentner for Feb., 1903, and took only 5320 Zentner; of the same purchase for March they took (for first three weeks) only 2000 Zentner. The interesting feature is Herr Williger's explanation, viz., that English coal was suddenly offered at lower prices, and they simply transferred their custom. He says the same thing occurs in Silesia, but recommends indulgent treatment.[2] Another example is that of the Landwirtschaftlichen Ein- und Verkaufsgenossenschaft für Schlesien in Breslau.

	Bought. Z.	*Took.* Z
December, 1902	19,000	12,520
January, 1903	19,000	12,500
February, 1903	24,100	13,200
March (to 23rd)	24,100	6,100

In this case the especially small quantity taken in March seems to have been due to the approach of the summer price schedule of April 1.[3] Irregularity in taking orders is a weakness of agricultural consumers for whom the need for coal, as well as convenience of opportunity in hauling the same, varies a good deal from season to season.[4] The associations claim, on the other hand, that they can take their orders regularly, and some of those that have dealings with Upper Silesia give no ground for complaint in this respect.[5] Herr Kirdorf considers the technical administrative difficulties of handling the orders of these numer-

[1] Enquete, pp. 439-442, 232-3, 136, 403, 215.
[2] *Id.*, p. 441; *cf.*, p. 426.
[3] *Id.*, pp. 441, 442.
[4] *Id.*, pp. 403, 442.
[5] *Id.*, pp. 407, 449, 428.

ous customers with small orders for various sorts of coal would be so great as to cause a considerable increase in costs.[1] To this the associations answer that they will take the order as a whole, and look out for the distribution of it themselves.

Finally the syndicate objects to direct sale to the associations on account of its desire to protect the dealers, whom it regards as necessary instruments in the sale of coal.[2] The difficult parts of sale—storage and sale—sale to the small consumers, sale of surpluses, sale of less desirable brands, etc., are more conveniently accomplished through middlemen. When they purchase they are required to take along with the good many inferior sorts, a condition which is not so easily imposed on the loosely organized associations, although they do offer a considerable variety in demand.[3] For these reasons, chiefly, the syndicate has almost invariably refused to deal with the associations, and referred them to the dealers.[4] In one case, however, an association of manufacturers in Holstein forced their hand by transferring their trade to the dealers in English coal in Hamburg.[5] The associations have therefore been referred generally to the dealers. There is naturally no love lost between them and the dealers, and complaints are frequent of bad treatment[6] though this is not invariable,[7] especially where the dealers are engaged in a price war with each other. Recently a complaint appeared from the Centralverband der Kohlenhändler Deutschlands, that the purchasing

[1] Enquete, p. 236.
[2] *Id.*, pp. 216, 237; *Cent. Verb. D. I.*, 1901, p. 241.
[3] Enquete, p. 410.
[4] *Id.*, pp. 135, 416, 214, 225.
[5] *Id.*, p. 435.
[6] *Id.*, pp. 212, 407, 415.
[7] *Id.*, pp. 216, 226.

associations of government officials (Beamtengenossenschaften) were engaged in trade.[1] Where the associations have been able to get coal directly they find their business with their members embarrassed by price cutting, which is often sufficient to seduce the loyalty of the associates.[2] No suspicion seems to have been directed against the syndicate as furthering this disloyalty.

The cause of the unfriendly relations between the syndicate and the associations seems to lie partly in the existence of a slight opposition of interests between the parties, but chiefly in the lack of business-like organization and practice in the case of some of the associations, on the one hand, and the contemptuous impatience of the syndicate with their business and methods on the other. The recent tendency to adopt a more conciliatory policy towards these associations is probably due less to a change of conviction or change of heart on the part of the syndicate than a politic desire to hush the incessant demands of the associations for recognition.[3] Though they might be able to exert some pressure politically,[4] they are not yet enough developed to exert an important economic influence.[5]

[1] *Tageblatt*, June 15, 1903.

[2] Enquete, pp. 416, 436, 456, 562.

[3] *Cf.*, J. B. Landwirtschaftskammer f. d. Rheinprovinz, 1900, p. 70; Abgeordneten, 1900, pp. 855–6, 3332; Reichstag, 1900, p. 297.

[4] Enquete. p. 431.

[5] *Cf.*, Calwer, 1901, pp. 106–7.

CHAPTER IX

CONDITION OF LABOR UNDER THE CARTELL RÉGIME

Circumstances do not require that we should make any extensive examination of the labor conditions of the coal industry. The syndicate and the convention have no relations with labor,[1] nor have they attempted to control or interfere in that side of the business. These matters are left entirely to the individual mines; even the Verein in Dortmund has taken no hand in the matter of wages,[2] though some associations of mine owners have been formed to deal with the matter of strikes.[3] Undoubtedly the coal cartells have had some influence of an indirect sort on labor, but in the sense that any condition which affects the prosperity of an industry in the long run affects the wage earner. Chief among the lines of possible influence are wages, the regularity of employment, length of day, external conditions of employment, independence of contract, cost of living, etc. While claiming that the coal cartells have no direct influence on labor relations, the leaders of the same assert that their indirect effect has been beneficial, both as respects wages and regularity of employment.[4] Of course there have not lacked others who have claimed that its influence was injurious to labor.[5]

A statistical summary of the wages paid gives a fair idea of the situation in this important particular.

From the beginning of the syndicate until 1900, the maximum year, wages advanced 33.1% in the Ruhr. From 1890, the year of the beginning of the convention, until 1900 the rise in Upper Silesia was 31.6%. But

[1] Enquete, pp. 252, 245, 534, 755.
[2] *Id.*, pp. 255–6.
[3] See p. 46.
[4] Enquete, pp. 534, 253.
[5] *E. g.* von Rottenburg, *cf.* p. 296.

Year.	Oberschlesien			Niederschlesien			Dortmund			Saar		
	Lab'rers	Shift Wages	Yearly Wages	Lab'rers	Shift Wages	Yearly Wages	Lab'rers	Shift Wages	Yearly Wages	Lab'rers	Shift Wages	Yearly Wages
		m.	*m.*		*m.*	*m.*		*m.*	*m.*		*m.*	*m.*
1888	40870	1.85	516	13974	2.04	630	102195	2.69	863	24102	2.92	842
1889	43183	2.03	575	14441	2.23	682	112073	3.05	941	25666	3.24	933
1890	48321	2.37	671	15841	2.45	735	123984	3.49	1067	27528	3.79	1114
1891	53493	2.46	693	16669	2.50	759	134603	3.54	1086	28897	3.89	1137
1892	53905	2.43	669	17294	2.46	747	138231	3.28	976	29823	3.69	1042
1893	52978	2.42	661	17205	2.42	729	142285	3.14	946	27536	3.37	925
1894	52300	2.45	664	17282	2.40	723	148280	3.16[1]	961	30070	3.24	921
1895	52388	2.46	675	17834	2.43	737	150212	3.18	968	30531	3.27	929
1896	54583	2.49	697	18104	2.49	757	157137	3.29	1035	32397	3.28	966
1897	56376	2.58	721	18846	2.59	787	171040	3.57	1128	34248	3.34	982
1898	58803	2.73	771	19522	2.67	812	185953	3.74	1175	35856	3.40	1015
1899	61989	2.87	801	20459	2.80	846	199138	3.96[1]	1255	38049	3.46	1019
1900	68425	3.12	877	22146	3.00	910	220031	4.18	1332	40303	3.56	1044
1901	77183	3.10	872	24107	2.92	871	236769	4.07	1224	41923	3.54	1042
1902	79179	2.97	820	24061	2.73	799	236543	3.82	1131	42036	3.57	1053

[1] *Tiefb. Berg.-Hütt. u. Salinen*, 1903, I, p. 38.

it would be fairer to take a year or two previous to the *hausse* of 1890; for example, if 1888 were substituted, the advance for Upper Silesia would be 69%. For the

same period the Ruhr shows 55%. Wages in recent years have been highest in the Ruhr. In this respect the Saar stands second. The advance in the Saar has been slight in the last fourteen years (22% between 1888 and 1902).

	All Classes.		(a) Regular Miners.		(b) Other Underground laborers.		(c) Laborers above ground.		(d) Boys under 16 years.		(e) Female.	
	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.	Number.	Aver. wages, year.
		m.		*m.*		*m.*		*m.*		*m.*		*m.*
Upper Silesia	77,183	872	44,152	969	11,618	919	15,144	783	2,120	302	4,149	321
Lower Silesia	24,107	871	12,234	936	4,434	906	6,303	810	797	332	339	469
Dortmund	236,769	1224	119,130	1447	67,267	1024	42,290	1080	8,082	355	----	----
Bonn	41,923	1042	24,517	1191	10,322	855	5,610	929	1,474	316	----	----

[1] *Berg. Hütten u. Salinen*, 1902, pp. 30–3, St. Theil.

The general averages of wages should be subjected to a somewhat closer analysis. The following wage classes are distinguished, viz., (a) regular miners; (b) other underground laborers; (c) laborers above ground; (d) boys under 16 years; (e) females. A general idea of their numbers and their wages is given in the table (p. 292) of averages for 1901.

It will be observed that only in Upper Silesia do the female laborers constitute a considerable element of the labor force; boys also, though more important than women, play, on the whole, a very subordinate part. The first three classes are the really important ones, and their wages from 1888 to 1902 were as follows.[1]

	Dortmund.						Saar.					
	(*a*) Regular miners.		(*b*) Other underground laborers.		(*c*) Laborers above ground.		(*a*) Regular miners.		(*b*) Other underground laborers.		(*c*) Laborers above ground.	
	Shift.	Year	Shift.	Year	Shift.	Year	Shift.	Year	Shift.	Year	Shift.	Year
1888	2.96	936	2.34	763	2 37	797	3.06	885	2.62	785	2.55	711
1889	3 42	1028	2.60	817	2.57	857	3.44	976	2.87	879	2.70	798
1890	3.98	1183	2.93	920	2.82	937	4.09	1180	3.23	1013	2.98	906
1891	4.08	1217	2.95	925	2.85	950	4 21	1212	3.30	1018	3.01	908
1892	3 87	1120	2 69	805	2.76	898	4 23	1167	2.96	868	2.98	869
1893	3.71	1084	2.59	791	2.70	878	3.83	1021	2.78	794	2.84	812
1894	3.73	1102	2.61	805	2.72	889	3.68	1020	2.65	791	2.79	810
1895	3.75	1114	2.65	816	2.74	893	3.70	1030	2.69	796	2.80	826
1896	3.90	1203	2.72	862	2.81	934	3.73	1079	2.67	821	2.76	826
1897	4 32	1328	2.88	926	2.96	993	3.80	1101	2 69	838	2.77	820
1898	4.55	1387	3.00	964	3.04	1022	3.90	1146	2.70	855	2.82	839
1899	4.84	1491	3.16	1027	3.18	1076	3 99	1158	2.72	842	2.86	846
1900	5 16	1592	3.36	1096	3.32	1125	4.11	1193	2.83	837	3.00	921
1901	4.98	1447	3.35	1024	3.32	1080	4.09	1191	2.89	855	3.01	929
1902	4 57	1314	3 22	955	3 25	1047	4.07	1189	2.93	869	3.01	929

[1] *Berg. Hütten u. Salinen*, 1903, pp. 40–1.

	Upper Silesia.						Lower Silesia.					
	(*a*) Regular miners.		(*b*) Other underground laborers.		(*c*) Laborers above ground.		(*a*) Regular miners.		(*b*) Other underground laborers.		(*c*) Laborers above ground.	
	Shift.	Year	Shift.	Year	Shift.	Year	Shift.	Year	Shift.	Year	Shift.	Year
1888	2.07	565	1.91	558	1.68	498	2.18	667	2.13	672	1.89	594
1889	2.31	638	2.06	614	1.83	539	2.40	728	2.35	727	2.03	634
1890	2.71	748	2.36	699	2.10	633	2.67	792	2.52	758	2.18	672
1891	2.83	774	2.44	728	2.17	649	2.74	824	2.57	779	2.23	690
1892	2.79	739	2.41	709	2.16	639	2.67	805	2.57	780	2.23	693
1893	2.74	727	2.42	704	2.15	622	2.60	775	2.54	762	2.21	687
1894	2.79	730	2.44	708	2.15	619	2.61	796	2.52	765	2.19	669
1895	2.78	740	2.46	713	2.14	634	2.59	773	2.49	749	2.18	670
1896	2.82	768	2.50	731	2.16	640	2.68	814	2.60	793	2.24	685
1897	2.91	794	2.61	765	2.22	648	2.80	849	2.70	820	2.31	709
1898	3.09	856	2.71	803	2.34	686	2.89	876	2.78	844	2.39	733
1899	3.27	896	2.86	827	2.44	705	3.04	916	2.92	886	2.49	759
1900	3.57	983	3.14	918	2.66	771	3.27	991	3.11	950	2.66	811
1901	3.52	969	3.17	919	2.69	783	3.15	936	3.03	906	2.68	810
1902	3.35	902	3.07	873	2.63	762	2.91	848	2.82	825	2.58	762

These statistics show, therefore, a great advance in wages during the period of the cartells. Whether this should be attributed to them depends on the answer to the question whether the *hausse* was caused or strengthened by the cartells, or whether it was simply the prosperity of German industry and the great demand for labor that caused this advance in wages. Although a slight decline in wages has set in since the crisis, it seems probable that the laborer will keep most of this advance permanently, because the productive power of labor generally in Germany has increased.[1]

The productivity of labor has not increased in coal

[1] May, pp. 592–3.

mining, however, measured in actual output, as may be seen from the following table of output *per capita* per shift.[1]

	Upper Silesia.	*Lower Silesia.*	*Dortmund.*	*Saar.*
	Tons.	*Tons.*	*Tons.*	*Tons.*
1888	1.265	0.739	1.015	0.886
1889	1.292	0.735	0.981	0.822
1890	1.233	0.674	0.935	0.767
1891	1.178	0.669	0.906	0.756
1892	1.110	0.649	0.895	0.744
1893	1.183	0.693	0.900	0.780
1894	1.216	0.708	0.900	0.772
1895	1.255	0.718	0.898	0.792
1896	1.284	0.725	0.908	0.808
1897	1.310	0 723	0.897	0.819
1898	1.357	0.735	0.873	0.819
1899	1.356	0.725	0.865	0.805
1900	1.293	0.709	0.851	0.795
1901	1.165	0.654	0.821	0.759
1902	1.118	0.649	0.828	0.766

This diminution of productivity is due presumably to the increasing difficulty of mining.[2] It affords, therefore, no fair standard of what the laborer should be paid; on the other hand, an increase in price of coal is hardly in itself, as some seem to think, a sufficient ground for an advance in wages.[3] This is obviously true, for example, where the price advance is due to an increase of other costs, or to an undue exploitation of the consumer. In the eighties, prices fell much lower than wages.[4] The comparison of wages with profits is only valid (if ever) for the laboring class and industry in general.[5] As far as the position of the mining laborer

[1] *Berg. Hütt. u. Sal.*, 1903, p. 43.

[2] Enquete, p. 482.

[3] *Cf. e. g.*, Enquete, pp. 250–1; Schoenlank, pp. 527–8; Kulemann, Juristentag, pp. 325–6.

[4] Huckinghaus, p. 87.

[5] Liefmann, however, advocates advancing wages in proportion to increase in profits, Liefmann, Unternehmerverbände, p. 198; and Landesberger thinks the laborer has a claim to a part of the gains of the Cartell. Landesberger, Juristentag, p. 342.

compared with other laborers is concerned, it seems to be favorable to the former on the whole, both before and since 1890.[1]

Dr. von Rottenburg, in an attack on the cartells, cited as a proof of their unfavorable effects on labor that the wages in the fiscal mines of Upper Silesia were considerably higher than the average. The situation in 1902 may be summarized as follows:

AVERAGE ANNUAL WAGES PER CAPITA.

	Men.	*Women.*	*Boys.*	*Total.*
Upper Silesia, (excluding Fiscus)	948 m.	308 m.	301 m.	890 m.
Fiscus	1072 "	429 "	333 "	1064 "

The figures for the non-fiscal mines include some not in the convention, but they are not important. The showing here is undoubtedly strongly in favor of the fiscus. The effect is not so impressive, however, if we observe that the fiscus possesses only two mines, and that these are exceptionally productive. The total per capita per shift wages are for the private mines 3.20 m. and for the fiscal mines 3.65 m.[2] Some of the private mines, such as the Paulus, approach very near the standard of the fiscus; for this mine the annual average wages were, for men, 1019 m.; for boys, 354 m.; and for women, 359 m.; the wages per capita per shift were 3.57 m.[3] The larger mines seem to make the best showing among the private mines, but none of them approaches the two fiscal mines in size. If we turn to the Ruhr, we shall find that equally great differences prevail between different mines; for example, the wages

[1] *Cf. Industrie Ztg.*, 1903, pp. 14–16, 63–64. Two articles by Dr. Tille on effect of cartells on wages. Huckinghaus, pp. 85, 119–20.

[2] Compiled from *Statistik Oberschl. B.-u. H.*, 1902, pp. 4–5.

[3] *Id.*, 1902, pp. 4–5.

per capita per shift for the period from 1893–1899 (inclusive) averaged as follows:[1]

o. b. a. b. Dortmund	3.43 m.
Syndicate mine, Mt. Cenis	3.94 "
Syndicate mine, Magdeburg	3.86 "
Non-Syndicate mine, Preussische Clus	2.49 "

This table does not prove anything for or against the syndicate. In fact the question of wages is determined by other considerations.[2] Again, it would not be proper to compare the scale of wages in two different districts, though on such a basis the Ruhr would, at least in recent years, make a much better showing than the Saar, as may be readily seen by an examination of the tables given above.

One of the advantages claimed for cartells by its advocates is the more steady employment of labor,[3] and the diminution of the "reserve army" of the unemployed,[4] though of course these claims are disputed.[5] In the case of the coal industry, fortunately the principal facts are obtainable, and are not a mere matter of opinion. The following tables give the number of laborers, the total number of shifts per year, and the average of the same per laborer.

A survey of this table shows, first, a very constant increase in the number of laborers employed, and, second, an equally striking regularity in the average annual number of days per laborer. In the Dortmund district the variations in the latter figure are slightly greater before than after the formation of the syndicate. The maximum variation during the period of the syndicates'

[1] *Dortmunder Jahrb.*, 1901.

[2] Enquete, (Kirdorf), p. 253.

[3] Grunzel, p. 137.

[4] Brentano, p. 26–7.

[5] *E. g.* Schoenlank, pp. 533–4; Vogelstein, p. 96.

Year.	Upper Silesia.			Lower Silesia.		
	Number of laborers.	Total Number of Shifts.	Annual average per laborer.	Number of laborers.	Total Number of Shifts.	Annual average per laborer.
1884	----	-------	----	----	-------	----
1885	----	-------	----	----	-------	----
1886	40,093	10,827,501	270	13,184	3,872,635	293
1887	39,973	10,799,964	270	13,572	3,964,855	292
1888	40,870	11,426,739	280	13,974	4,323,156	309
1889	43,183	12,195,516	282	14,441	4,419,761	306
1890	48,321	13,678,250	283	15,841	4,754,551	300
1891	53,493	15,042,703	281	16,669	5,061,419	304
1892	53,905	14,802,945	275	17,294	5,255,995	304
1893	52,978	14,458,544	273	17,205	5,186,417	301
1894	52,300	14,149,503	271	17,282	5,203,604	301
1895	52,388	14,400,963	275	17,834	5,400,779	303
1896	54,583	15,275,644	280	18,404	5,605,041	305
1897	56,376	15,740,882	279	18,846	5,732,625	304
1898	58,803	16,586,138	282	19,522	5,938,032	304
1899	61,989	17,303,483	279	20,459	6,191,010	303
1900	68,425	19,202,080	281	22,146	6,726,037	304
1901	77,183	21,683,277	281	24,107	7,199,326	299
1902	79,179	21,895,207	277	24,061	7,037,951	293

Year.	Dortmund.			Saar.		
	Number of laborers.	Total Number of Shifts.	Annual average per laborer.	Number of laborers.	Total Number of Shifts.	Annual average per laborer.
1884	----	-------	----	25,050	7,497,631	299
1885	----	-------	----	25,259	7,328,322	290
1886	99,952	29,944,901	300	24,714	7,009,483	284
1887	102,195	32,744,272	309	24,240	6,863,315	283
1888	102,195	32,744,272	321	24,402	7,044,511	289
1889	112,073	34,536,776	308	25,666	7,402,343	288
1890	123,984	37,943,370	306	27,528	8,099,128	294
1891	134,603	41,302,478	307	28,897	8,447,211	292
1892	138,231	41,167,434	298	29,823	8,416,568	282
1893	142,285	42,891,969	301	27,536	7,544,148	274
1894	148,280	45,101,880	304	30,070	8,537,175	284
1895	150,212	45,818,644	305	30,531	8,691,261	285
1896	157,137	49,437,574	315	32,396	9,538,614	294
1897	171,040	54,000,336	316	34,248	10,085,126	294
1898	185,953	58,454,038	314	35,856	10,700,054	298
1899	199,138	63,196,746	317	38,049	11,207,967	295
1900	220,031	70,018,418	318	40,303	11,822,059	293
1901	236,769	71,228,774	301	41,923	12,345,184	294
1902	236,543	70,074,738	296	42,036	12,399,577	295

[1] *Berg- Hütten u. Salinen*, 1903, p. 43; 1889, pp. 85–6.

operation was twenty-two days. For the same period in the Saar the variation was twenty-four days, in Upper Silesia eleven days, and Lower Silesia twelve days. These results seem quite normal, because the two former districts are dependent in a much greater degree for their activity on the industrial situation. In the Ruhr syndicate the recent crisis necessitated a considerable reduction in output, but, instead of discharging laborers the general practice was to diminish the number of shifts, keeping the pay-rolls practically intact.[1]

Next to wages and regularity of employment, perhaps the most important condition is the length of the labor day. In this respect there is an extraordinary difference in the different mining regions. The ancient,[2] as well as the most modern rule in the Ruhr, is the 8 hour day, but in Upper Silesia 12 hours and even more are not uncommon, but here, it should be said, that an hour is taken out for the midday meal and time in the morning for prayers,[3] etc. One of the alleged abuses in the Ruhr, at the time of the strike in 1890, was that the day had been extended with the development of deep mining by often an hour or more, by not including in the 8 hours the time for going in and out of the mine.[4] The mine-owners offered to compromise on an 8 hour day and a half hour additional for going in and out.[5] The situation in 1889, according to the official record, was as follows: In Dortmund, before the strike (in the spring), generally 9 hours, including going in and out; labor at hot points, 6 hours; after the strike, the same. In the Saar, before the strike, average 10 hours, including going in and out; after

[1] Enquete, p. 258.
[2] Huckinghaus, p. 102.
[3] Huckinghaus, p. 104.
[4] Huckinghaus, p. 102.
[5] Huckinghaus, pp. 102–3.

the strike, 9 hours for large mines and 10 for others; for the last quarter, 8 hours, excluding going in and out. For Upper Silesia, the hours for the last quarter of 1889 varied, from 8 to 12 hours, the proportions being as follows:

8 hours	4.1	per cent. of laborers.
10 "	32.2	" "
11 "	3.1	" "
12 "	60.6	" "

For Lower Silesia, the hours and proportions were[1]

8 hours	10.2	per cent. of laborers.
10 "	89.7	" "
12 "	0.1	" "

That the cartells have not had an injurious effect in prolonging the labor day may be seen by comparing these figures with the more complete tables furnished for 1902, which follow.[2]

	Upper Silesia		Lower Silesia		Dortmund		Saar.	
	Laborers, % of total	Hrs.	Laborers, % of total	Hrs.	Laborers, % of total	Hrs.	Laborers, % of total	Hrs.
(*a*)	10.3	8	67.9	8				
Regular miners.	58.1	10	32.1	10	100	8– 9	100	9
	31.6	12	—	—				
(*b*)	7.2	8	64.5	8				
Other underground laborers.	51.7	10	34.6	10	100	8– 9	100	9
	41.1	12	0.9	12				
(*c*)	3.3	8	8.9	8				
Laborers above ground except boys and women.	35.1	10	49.7	10	100	8–12	100	9.5
	61.6	12	41.7	12				
(*d*)	22.9	8	33.1	8				
Boys under sixteen years.	43.5	10	66.2	10	100	6–12	100	7
	33.6	12	0.7	12				
(*e*)	0.2	8	3.0	8				
Women.	54.6	10	58.7	10	—	—	—	—
	45.2	12	38.3	12				
	8.0	8	49.0	8				
All laborers.	51.3	10	38.8	10	100	6–12	100	9
	40.7	12	12.2	12				

[1] *Berg. Hütten u. Salinen*, 1890, p. 70.

[2] *Berg- Hütten u. Salinen*, 1903, p. 37; (includes going in and out in all cases).

An exhaustive analysis of the conditions of labor would be inappropriate here, but a few points may be noted.[1] Women are forbidden to work underground, and in general the police regulation of the mines is thorough, and appears to be well enforced.[2] The number of fatal accidents have steadily decreased since 1880. The average number in the Ruhr per 1000 men employed has been as follows:[3]

1870	3 777
1880	4.158
1890	2.966
1900	2.367

The mines themselves spend an increasing amount for the benefit of the laborer. One feature of the system in the Ruhr is the construction of laborers dwellings.[4] These are both praised and blamed.[5] The fiscal arrangements in the Saar have been specially praised.[6] It seems that in the external conditions, therefore, the laborer has experienced an improvement.

Writing fourteen years ago, Steinmann-Bucher declared that one of the gains to be expected from the cartells would be a reduction in prices.[7] The coal cartells have not reduced prices, but, before we can answer the question whether their influence in this respect has been disadvantageous to labor through increasing the cost of living, we must answer the question whether the prices would have been higher without them, etc. The same must be said of the indirect effects of a high cost

[1] Buff, p. 236.

[2] Huckinghaus, pp. 1.3–14.

[3] Köhne, p. 193.

[4] *Cf.* especially Hundt. Arbeiterwohnungen auf den Zechen des Ruhrreviers, *passim.*

[5] *Cf.* Reichstag, 1900, pp. 343–4.

[6] Abgeord., 1903, p. 1699.

[7] Steinmann-Bucher, Wesen, etc., p. 182.

of coal on other commodities. The duration of high prices must, of course, be taken into account also. The probable answers to these two questions would be that prices would have gone higher, but that they would have declined more quickly. What the net quantitative effect would be no man can say, and it may be regarded as quite doubtful on which side the balance would hang.

Another interesting problem, but one to which at present no very positive answer can be given, is the effect of the coal cartells on the organization of labor. The cartells as such have not interfered with the relations of employer and laborer.[1] Both cartells and unions represent combination as opposed to competition, and the formation of unions may be considered as a counterpoise to the cartells. In the old "Knappschaften" the miners possessed a strong organization,[2] but the modern trades unions are not strong.[3] Apart from the general backwardness of the labor movement in Germany, as compared with England or France, there are special reasons that work against labor organizations, at least in the Ruhr. First, there are differences in nationality, and, second, there are differences in religion. Of the differences in nationality we have spoken elsewhere;[4] the Catholics and Protestants are about equal in number.[5] Another element of discord is the Social Democracy.[6] This lack of organization among the laborers appears to diminish the incentive for a close organization among employers to

[1] Enquete, p. 257.

[2] Oldenburg, p. 328, Arndt.

[3] Huckinghaus, p. 123; Pieper, p. 172; Oldenburg, p. 215; Parteitag, Soc. Dem., p. 165.

[4] See p. 36.

[5] Schneider, p. 32; *J. B. Verein*, Dortmund, 1889, p. 29; Calwer, 1900, pp. 96–7; *Bochum Hk.*, 1894, p. 8.

[6] Huckinghaus, p. 123.

deal with labor questions.[1] Which would be the stronger, in general, when well organized, the unions[2] or the cartells,[3] is a matter on which opinions differ; and the same is true of the question whether on the whole the cartells have been favorable[4] or unfavorable[5] to labor. Prof. Waentig fears that the reconciliation of capital and labor will be fraught with great danger for the consumer.[6] Sarter thought ten years ago that the danger of strikes in the coal industry was increased;[7] the history of the syndicate has, however, been singularly fortunate in this respect, due, doubtless, rather to the good times than any extraordinary merit on the part of the syndicate.

[1] Enquete, p. 252.

[2] Brentano, p. 27; Conrad, p. 246; Grunzel, p. 140; Schoenlank, p. 536.

[3] Bebel, Reichstag, 1902, p. 6134; Hitschmann, p. 11.

[4] *E. g.* Tschierschky, pp. 126–7; Fridrichowizc, pp. 642–3; Landesberger, Juristentag, p. 345; Juliusberg, p. 26; Nentwig, Juristentag, p. 296.

[5] Stieda, *Verein f. Soc. Pol.*, LXI, p. 21; Bücher, *Ib.*, p. 149.

[6] Waentig, p. 31.

[7] Sarter, p. 51.

PART V

REGULATION AND REFORM

CHAPTER I

PRESENT SITUATION

The subject of the regulation of cartells in general does not come within the scope of the present writing, but as the coal cartells are invariably included in these proposals, it is proper that we should consider the general subject briefly, and those proposals which have more particular application to the coal cartells in more detail. Before we consider them, however, we should examine the present status of the cartells in respect to the law.

The civil law in Germany implicitly recognizes the obligation of cartell contracts, because it recognizes the general principle of freedom of contract without making any exception in the case of cartell contracts.[1] The only provision of the code which could be held to put their legality in question is § 138, which declares that contracts that are repugnant to morality are void.[2] The prevailing views of commercial morality, however, find nothing repugnant thereto in cartell contracts *per se.* The law also provides for freedom of occupation,[3] where not otherwise limited by law, but judicial authority has interpreted this as not inconsistent with cartell con-

[1] *Cf.* Landesberger, Juristentag, p. 350; Menzel, Die Kartelle und die Rechtsordnung, p. 16; Hirsch, Die rechtliche Behandlung der Kartelle, p. 7.

[2] B. G. B., § 138. "Ein Rechtsgeschäft das gegen die guten Sitten verstösst ist nichtig."

[3] Gewerbeordnung, § 1.

tracts restricting such activities.[1] It happens, indeed, that the highest court of the Empire has considered and upheld the validity of the compact between the Rheinisch-Westfälische Kohlen Syndicat and the mine owners (in a dispute respecting the supply of coal by a Hüttenzeche).[2]

The criminal law in Germany declares no prohibition against cartell agreements, as such,[3] though, like contracts between individuals, they may be offensive to the criminal law in certain cases.

Under the administrative law, cartells are free from any control or restriction. The mining industry itself is subject to considerable administrative control, not only in respect to labor and the safety of the same, but also in the initiation of the business, and to some extent in the technical operation.[4] Where mining companies are formed, they come under the provisions of the commercial code (Handelsgesetzbuch) and miners themselves, and those employing them, are controlled in many ways by the industrial ordinances (Gewerbeordnung). An important provision of the mining law is § 65, which provides that the government may intervene to compel parties holding mining lands to develop and operate the same under penalty of forfeiture.

The regulation of cartells, or the cure of cartell abuses, may be attempted in two ways; first, by law, second, by various politico-economic measures. The

[1] *Cf.* Entsch. d. R. G. in Civ. S. Urt. v. 25. Juni, 1890; see also Menzel, pp. 44–6; Hirsch, pp. 7–8.

[2] Entsch. d. R. G. in Civ. S. Urt. v. 19 Feb., 1901, Zeche ver. Hannibal w. Rh.-W. Kohlen Syndicat.

[3] *Cf.* Landesberger, Juristentag, p. 350; Menzel, p. 16; Hirsch, p. 10.

[4] Huckinghaus, p. 13. Formerly, *i.e.*, before 1852, the State controlled the principal business operations of the companies.

legal regulations are naturally divided into (a) criminal, (b) civil, (c) administrative. The politico-economic measures are not capable of such a simple classification, but they include such measures as the application of the taxing power, especially in connection with customs taxes, the use of the rate-making power in railways, state enterprise, either as a monopoly, or in competition with other producers, etc. In a general examination of the subject, the legal measures would require extended consideration, but that would be out of place here, as there is nothing peculiar about the coal cartells. Only a brief statement of the chief kinds of legal remedies suggested will be given. Among the politico-economic measures, only those will be considered which are of special interest in connection with the coal cartells.

CHAPTER II

LEGAL REGULATION

The proposal to cure the evils caused by cartells, by prohibitions of the criminal law are perhaps the first to occur to the reformer, but the least effective of any. There are two objections, either of which is almost fatal; first, prohibition does not prevent, and secondly, the prohibition can be evaded by transforming the cartell into a single company (fusion, trust).[1] It would be impossible, practically speaking, to prohibit large companies in general. Instead of prohibiting cartells, certain acts of cartells may be forbidden, and such provisions in many cases, such as a prohibition of unreasonable prices, could be applied to the fusion as well as the cartell, but, in either case, the practical enforcement might be impossible. A prohibition of the coal syndicate or the convention of Upper Silesia would have resulted probably in a secret cartell of the most powerful producers, and the gradual elimination of the smaller and weaker ones. The tendency to consolidation would have been enormously stimulated, and, even if that were prohibited, it could hardly be prevented in a disguised form through a system of stock ownership. The application of penal laws to a cartell to prevent "excesses" is full of difficulty, practically, and open to very grave objections as a matter of jurisprudence, unless the acts made punishable are such that they would be subject to penalty if committed by a private person.[2]

[1] *Cf.* Steinbach, pp. 5–7; Klein, Juristentag, p. 301; Urban, p. 8; Grundberg, p. 207; Friedrichowizc, p. 649; Wittelshöfer, p. 128, etc., etc.

[2] *Cf.* Erlaut. Bemerk., Gesetz-Entwurf, Verbot d. Rübenrayonnirung. Österr. Abgeord. 1678 d. Beilagen, 1903.

Cartells may be legislated against through the civil law. The most radical measure is to declare a cartell contract null and void. Experience has proved, however, that this of little or no practical effect; the Austrian cartells flourish, although they are in exactly this situation.[1] Ordinarily, judicial cognizance of the matter would arise through resort of the members of the cartell to the courts, but this would seldom occur, because commercial honor and business convenience would generally require the fulfilment of the conditions of the compact.[2] Where the law allows action by the public prosecutor, or action by third parties, claiming to be injured, for damages, the position of the cartell may be certainly much more precarious, but history has not shown such remedies to be very effective. Special provisions of the law aiming at abuses of cartells, rather than their existence, have a better chance of success, and are more consonant with the ideas of the age. The German law against unfair competition applies of course to the individual as well as the cartell.[3] Of more practical value, also, are laws which regulate contracts so as to procure a fair degree of equality in determination and obligation.[4]

Cartell reform or regulation through the administrative law aims to accomplish its purpose, generally, either by procuring publicity or by providing administrative supervision and control. One of the simplest, and perhaps the best remedy for cartell abuses, is the requirement of publicity. This may be provided for in various ways, but principally through (1) report of organi-

[1] *Cf.* Menzel, Die Kartelle, p. 51; Landesberger, Juristentag, p. 367.

[2] Grunzel, p. 158.

[3] Gesetz zur Bekämpfung des unlauteren Wettbewerbs v. 27 Mai, 1896.

[4] A good illustration is found in §§ 6, 7. Gesetz-Entwurf btr. d. Verbot d. Rübenrayonnirung, etc.

zation and business operations, and (2) public register.[1] Some would make the validity of the cartell depend on registration, others would not. Some oppose publicity on the ground that it is injurious to national economic interests by revealing trade secrets and conditions.[2] More important is the objection that publicity does not constitute a cure; that the cartells committing the greatest excesses have done everything under what may be called the glare of publicity. The Halbzeugverband is cited as a conspicuous instance.[3] This last criticism is of particular interest in connection with the coal and coke syndicates. Almost everything done in the coal syndicate (except export business) has been published far and wide, and probably this fact has had an important influence in giving its policy a more moderate character than most cartells, much more moderate, for example, than the coke syndicate which has been more secret in its methods.

A more far-reaching proposal for administrative control is the proposal for the establishment of a Cartell Bureau with more or less extensive powers of supervision. The Austrian cartell bill and Reich's proposal provided for such a board composed partly of government officials, partly of business men.[4] In both cases, its powers were chiefly advisory and investigatory. Steinbach, Urban and Landesberger prefer a quasi-

[1] Advocated by Menzel, pp. 27, 29; *Prag Hk.*, pp. 126–7; Urban, pp. 26, 28–9; Cartell Comité, Österr. Industrierath, p. 14; Bücher, *Ver. f. Soz. Pol.*; Österr. Cartellgesetzentwurf, pp. 26–7; Landesberger, Juristentag; Liefmann, *Conrad's Jahrb.*, pp. 800–1; Reich, Entwurf, pp. 5, etc., etc.

[2] Kulemann, Juristentag, p. 323; Steinbach, pp. 5–7.

[3] Huber, p. 72.

[4] Österr. Cartellgesetzentwurf, § 11; Reich (Entwurf, §§ 9–11), pp. 4–6; *cf.* also Klein, Juristentag, pp. 313–16.

judicial organization,[1] but the functions allotted to them are limited chiefly to the verification of reports, etc., and the adjustment of fines for the neglect to comply with the regulations prescribing the same. Huber takes the pessimistic view that the Cartell Bureau would degenerate into a cartell organ, and that, in the fight against the cartells, the first step necessary would be the abolition of the Cartell Bureau.[2]

The important question in establishing a Cartell Bureau is the powers that shall be given it. As long as it is constituted an organ of publicity simply, it can not do much harm, and it may, if properly conducted, be an instrument of far-reaching utility. Knowledge of the facts is certainly a prerequisite to any intelligent action with respect to cartells, and there seems to be no sufficient reason why the industrial interests should be permitted to keep them secret. The German coal cartells profess to be ready to give the government all the available information it requires about their business, and the government, on its side, seems to be perfectly satisfied with the completeness of the information it has obtained. Whether any of the so-called excesses of these cartells would have been prevented, if supervision had been established more systematically and a little earlier, might be questioned, but probably it would have made them more careful.

If, instead of being made merely an organ of publicity, a Cartell Bureau is given large powers of control, the question of its advisability becomes much more problematical, and its conduct and operation vastly more difficult. Two characteristic methods of control are (1) limitation of dividends and (2) price regulation.

[1] Steinbach, pp. 7–8; Urban, pp. 29–30; Landesberger, Juristentag, p. 385.

[2] Huber, p. 74.

The limitation of dividends has generally been ineffective, through lack of proper control of the powers of stock-issue and book-keeping, defects which would seem to be remediable. Whether such a limitation is desirable or not is a question that cannot be properly stated or answered in a brief form. Price control attacks the problem even more directly, and may be regarded as the ultimate end of all cartell regulation. It must be regarded certainly as an extreme measure,[1] if undertaken directly. Price regulation by the State has a long, if not a very successful history. The problem of fixing reasonable prices is, indeed, one of enormous difficulty, theoretically as well as practically, and some declare it impossible of solution.[2] Much depends on the definition of the term reasonable price. In a given case of exorbitant prices, a moderately intelligent and informed administrative board could make them *more* reasonable. Whether it is desirable to interfere with the economic order in such a radical manner, and whether the burden imposed on such a body, if the whole industry of the country were drawn under its supervision, would be too much for it, might well be put in question. At any rate it would not seem just to subject a single industry to such control without specially cogent reasons, and no such reasons appear to exist at present in the German coal industry. As a matter of history, the coal industry in Prussia was at one time regulated as respects wages, profits and the amount of production,[3] and the change to a system of private control was deemed desirable both in the interests of the industry and of the public. It is very improbable that a return to the system of state control would benefit either.

[1] Steinbach, pp. 5–7.

[2] *Cf.* Grunzel, pp. 164–5; Brefeld, Reichstag, 1900, p. 282.

[3] Huckinghaus, p. 11; Menzel, pp. 286, 289.

CHAPTER III

ECONOMIC REGULATION

The attempt to cure cartell abuses through economic action may take a great variety of forms. One of the most important is in the way of what may be called financial discrimination, as through taxation, direct and indirect, and railway rates, where the state owns the railways. We need consider only two here, namely, customs taxes and railway rates.

It is often asserted that cartells are dependent on customs protection for their existence, and it is demanded, therefore, that such protective taxes should be abolished. This view of the matter is not correct, as a general proposition, and the German coal cartells serve as a good illustration of the fact, because in Germany there are no protective customs duties on coal. As there is no protection established, the coal cartells could not be attacked in that way. On the other hand, the state might impose an export duty on coal, or even prohibit its export. Such measures would have a very practical bearing in the case of the German coal cartells as they are all largely interested in the export trade, except those producing brown coal. An evident objection to such a measure is one that is applicable to all export taxes, where a country does not possess a dominating position in the commodity to be exported, namely, that it injures national industry.[1] A second serious objection to such a measure is that it falls alike on the "just and the unjust," according to our present hypothesis, the independent as well as the cartelled producer, or the good cartell as well as the bad cartell. Another objection in

[1] *Cf.* Brefeld, in Reichstag, 1900, p. 281.

the case of Germany is of a technical character, namely, that it would be inconsistent with commercial treaties.[1] The prohibition of coal exports was advocated in Germany at the time of the coal famine,[2] but the Government, as well as the commission appointed to investigate the matter, opposed this demand as injurious to German interests and to the coal industry.[3]

The prohibition of coal exports, or the restriction of them through an export duty, considered simply as a cartell remedy, may have two purposes: (1) to prevent the maintenance of high domestic prices, through an artificial scarcity created by exports, (2) to prevent low export prices for a raw material which may serve to aid foreign competitors.

The weakness of such a measure for the coal industry is seen in the fact that the home supply would not necessarily be increased, because the export production is not to be regarded as so much substracted from a definite output, but rather as an extra production caused by increased market possibilities. Such an increase in production, at least for short periods, tends to diminish rather than increase costs, and makes possible, at least, a lower scale of domestic prices without reducing the producer's profits. More might be said for this remedy in respect to the second purpose, the prevention of low export prices. If that practice were carried to a great excess and in a way to directly aid foreign competitive producers, such a measure might be expedient in extremity. Looking at the matter from a practical standpoint, however, it may be observed that the concessions made to the foreign consumer are of the same kind as

[1] Reichstag, 1900, p. 354; *Industrie Ztg.*, 1900, p. 434.

[2] Reichstag, 1900, pp. 252, 277.

[3] Brefeld, Reichstag, 1900, p. 281; Abgeord., 1900, p. 856; X Commission, p. 21.

those made to the domestic consumer in remote or competitive markets, and has nothing necessarily anti-national about it, and, secondly, that such low export prices are generally more than counterbalanced by high freight costs or import taxes (*e.g.*, France), and, so far as discoverable, have not been granted in such amounts nor in such a systematic way as to really threaten the national producer. Whether an international arrangement, operating through the customs tax *régime*, could be made effective against coal cartells, in something the same fashion as the Brussels Sugar Convention, is a matter that has not yet become a question for practical consideration, and such an attempt at control could probably be evaded through the organization of international cartells, for which precedents already exist in this branch of industry (Belgian and Westphalian coke syndicates).

Another weapon which may be used against cartells, and which for cheap and bulky commodities like coal is almost as effective as customs restrictions, is possessed by those states which control the railways. Apart from general theoretical discussions, the use of the railway rates has been advocated to control the policy of the coal combinations. For example, in 1890 Messrs. Richter and Schrader proposed in the Reichstag that the import rate and export rate for coal should be made equal, as a check against low export prices.[1] Although the government refused to intervene, the minister, Herr Berlepsch sharply denied the claim of the coal people that the government had nothing to say about their price policy when it came to rate-making.[2] Similar demands were made from various quarters

[1] Effertz (1891), p. 4; *cf.* Kanitz, p. 22.

[2] *Jahresbericht d. Vereins*, 1890, p. 112.

in 1900, especially for the abolition of low export rates.[1] The late Herr von Thielen, as minister of public works (railways), defended the export schedule as necessary and desirable for the coal industry,[2] and, when immediate changes were advocated in 1900, he pointed out that it would be unfair as contracts were formed on the basis of existing rates. The government of Prussia and several other German states agreed, however, to a reduction of the import rate to the scale of the "raw stuff" import rate for a period of two years.[3] The coal syndicate in its annual report for 1901 protested against its continuance, although it asserted, with apparent correctness, that it had had no appreciable effect on the coal trade.[4]

The efficacy of this remedy depends a good deal on circumstances. Normally the cost of transportation is a very significant element in determining the radius of the coal market, and it is partly to overcome this obstacle that systematic price reductions are made in case of sales to distant domestic or foreign markets. But the railway administrations are not perfectly independent in fixing rates, because they must not only meet the competition of other transportation agencies, but they must also put the rates at such figures as will get business, and long distance traffic must be encouraged by low rates, so that the interest of the railway administration is often the same as that of the producer in making a

[1] *Industrie Ztg.*, 1900, pp. 405, 486. A demand was made in the Reichstag for a higher export rate; Heim, Reichstag, 1900, p. 277. In 1891 Herr Kirdorf called attention to the fact that the government had made low rates always on the condition of corresponding reductions in prices for such exports. Huckinghaus, p. 47.

[2] Reichstag, 1900, p. 283; *cf.* Denkschrift, p. 16.

[3] *Industrie Ztg.*, pp. 405, 413; Calwer, 1900, pp. 84–5; *Mittelfranken Hk.*, 1900, pp. 134–5.

[4] Bericht d. Rh. W. Kohlen Synd., 1901, p. 9.

low export rate. The possibility of checking or controlling the coal cartells through the control of railway rates depends primarily on the location of the coal regions with respect to the means of transportation. Coal districts lying near the border of a country could not be prevented from exporting their product to any great extent without a radical revolution in the rate policy.[1] The general principles of the German rate systems require low export rates and low rates on heavy commodities. To overturn this system would be a questionable course, and it would be equally questionable to make the rate system wholly arbitrary and a matter of power or influence rather than scientific principle. In the case of a large part of the exports from the Ruhr, the railway rates form a relatively small part of the cost of transportation, because the Rhine gives easy access to the principal foreign markets. The Upper Silesian coal fields lie right on the border, and they also have available water transportation into Russia and to the Baltic and North Seas. Further, any attempt to cut off any foreign district from its usual source of supply of German coal (*e.g.*, Bohemia or the French Minete) would probably lead to international complications and perhaps to commercial retaliation. It is evident, also, that this device of correcting cartells would be subject to the drawback of not discriminating between the cartelled and non-cartelled producer, though, as the cartells are in different districts, it might discriminate between the good and bad cartells.

The difficulty in abolishing or controlling cartells

[1] Of course we leave out of consideration any senseless destructive attack on the coal industry. It would be possible, in extremity, to refuse transportation altogether, but there are plenty of radical measures possible which would be much more harmful than the cartells were ever accused of being.

has led some writers to attack the problem from the other side, and to suggest state recognition of cartell monopolies with some voice in their management.[1] The Kali cartell has suggested a solution to some,[2] and the Russian Normirowka to others.[3] The Prussian fiscus is a member of the Kali cartell, and also the fiscus of the Duchy of Anhalt, the former having a participation of 8.12%, and the latter 7.28%. Formerly their shares were much larger.[4] The Prussian Minister of trade and industry, Brefeld, naturally commended this institution,[5] but his commendation fell rather flat in face of his objection to the adhesion of the fiscal coal mines of Silesia to the convention, on the ground that they would be "majorisirt",[6] because the voting power of the fiscal mines in the convention would be much stronger than in the Kali cartell. The Coal Commission of 1901 favored the organization of a fiscal syndicate in Upper Silesia.[7] Assuming that a fiscal cartell would be a good thing, it does not seem that it would have much influence, unless it possessed a considerable portion, say 25–30%, of the production. At present this might be tried in Silesia, but the fiscus does not control enough for such an experiment in the Ruhr.

From a fiscal cartell it is not a very long step to government ownership (nationalization) of the coal fields. It exists, of course, already in the Saar. It has been recommended as a practical reform in a good many quarters, and even by many who oppose the nationali-

[1] Kleinwächter, p. 177, *et seq.*; Weiskirchner, p. 12.

[2] Liefmann, Unternehmerverbände, p. 196; Huber, p. 75.

[3] Borger, *Kartell-Rundschau*, p. 245.

[4] *Kartell-Rundschau*, pp. 726–7; Westphal, Geschichte des Königlichen Salzwerks zu Stassfurt, *Zeits. f. d. B.-H. u. S.*, 1902, p. 31.

[5] Reichstag, 1900, p. 337.

[6] *Ib.*

[7] X Commission, p. 27.

zation of industries in general.[1] The opposing opinion is quite as respectable.[2] A good many favor a half-way policy, *i. e.*, the acquisition of a considerable portion of the coal lands by the government, with independent action.[3]

The most striking argument made in favor of nationalization of the coal fields is that of Schaeffle, who concludes, however, in an opinion against its general application. The true argument for nationalization proceeds from two grounds; first, the danger of dissipating a vital source of national prosperity, through reckless profit-seeking, private methods of exploitation, and, second, the importance of direct control by the state of an industry, the temporary interruption of which would endanger the national economy and even political safety. In this last respect, Schaeffle finds the peculiar character of the railways and the coal mining industry.[4] Further advantages claimed for state enterprise in coal mining are found in the fact that it is a large, non-speculative industry, that it must be operated by salaried officials in any case, that it affords a practicable means of preventing abuses in selling the output (*e.g.*, low export prices)[5], that it affords security against strikes, that it improves the situation of labor, etc.[6] The strength of any plea for nationalization depends very much on the

[1] Waentig, Juristentag, pp. 288–9; Bücher, *Ver. f. Soz. Pol.*, p. 156; Grundberg, pp. 209–10; Ofner, *Ver. f. Soz. Pol.*, p. 190; Schleper, pp. 5–6; Reich, Entwurf, p. 24; Bebel, Reichstag, 1902, p. 6125.

[2] For example, Brentano, *Ver. f. Soz. Pol.*, p. 172; Menzel, Juristentag, pp. 288–9; Conrad, p. 248; Arndt, Handwörterbuch, pp. 555–6; Huber, 89; Franz, p. 15; Pohle, pp. 145–6; Grunzel, pp. 166; Huckinghaus, p. 51; Liefmann, *Jahrb. f. Nat. Oek.*, p. 792, etc.

[3] *Cf.* Schaeffle, pp. 683, 698; Huber, p. 75; Sayous, p. 368; X Commission, 1901, p. 27; Gamp, Reichstag, 1900, p. 350.

[4] Schaeffle, pp. 613–26.

[5] Huckinghaus, pp. 24–6, 47, 61.

[6] *Cf. Industrie Ztg.*, 1900, p. 226.

character of the public administration, and in this respect few states can be compared with Prussia. In Schaeffle's mind the chief objections to nationalization seem to be that it would be against the general historical course of civilization, and that state socialism, if carried far, especially in a country with popular suffrage, is dangerous.[1] Many would sympathize with this view, and find in it the decisive answer to the question. The charge that private exploitation is wasteful is met by the argument that the neglect to work the smaller and poorer coal seams is simply due to the limitations of price and cost, which would exist just as much for the state, if the enterprise were conducted on a self-supporting basis without advancing prices. While there is such a thing as wasteful coal mining, it may be observed that it tends to disappear with the organization of the business in large corporations with extensive coal fields and prospects of a long existence. Considering that the known supply under existing conditions of technique, and with a continuation of the present curve of production, will last at least several hundred years, if not thousands, it is argued that anything else than a reasonable system of commercial exploitation would be absurd.[2] That the laborer would be any better off under state control is vigorously denied,[3] and it is significant, in this connection, that the convention of the Socialist Party in Essen, in 1894, was opposed to the nationalization of coal lands.[4] The strikes in the fiscal Saar seem to have been as bitter

[1] Schaeffle, pp. 644, 689–90.

[2] *Cf.* Huckinghaus, pp. 59, 62 ; Gothein, p. 13 ; Arndt, Handwörterbuch, p. 556.

[3] Brentano, *Ver. f. Soz. Pol.*, p. 1172 ; Gothein, pp. 26–8 ; Laur, p. 138 ; Lenzmann, Reichstag, 1900, p. 379.

[4] Laur, p. 139.

and severe as anywhere.[1] Schaeffle asserts that they are not avoidable under any system of social organization, and are more dangerous in the case of state industry.[2] From the financial standpoint, the objections urged to nationalization are that it would be difficult to appraise the coal properties,[3] while, of course, a high price would make a successful and economical operation impossible. It is claimed that at the present day the fiscal mines are not so economically operated.[4] Bueck makes the very pertinent objection that it would be inadvisable to increase those revenues of the government which are independent of parliamentary control, and he points out the fact that the railway has been used as an instrument of taxation.[5] From the foregoing examination of the price policy of the fiscus, it does not appear that state ownership would be of any advantage to the consumer. A considerable improvement in the existing system of state operation would probably result from the introduction of a system of advisory councils, containing representatives of various economic and public interests, such as already exist in the railway service.[6] One of the faults that the Coal Commission of 1901 found with the fiscal system was that it did not keep sufficiently in touch with the market.[7] Two forms of state intervention are considered practicable by Schaeffle, which he describes as institutionalization (Veranstaltung) and nationalization (Verstaatlichung). The former provides only for the regu-

[1] Bueck, *Industrie Ztg.*, 1900, pp. 226–7.

[2] Schaeffle, pp. 680–1, 689.

[3] Gothein, p. 36.

[4] Lenzmann, Reichstag, 1900, p. 379. Laur's data are scarcely admissible, pp. 132, 137.

[5] Bueck, *Industrie Ztg.*, 1900, pp. 226–7.

[6] Schaeffle, p. 694; X Commission, p. 27.

[7] X Commission, pp. 23, 26–7.

lation of the internal technical operations and the relations with labor, leaving the commercial operations untrammelled; the latter provides for complete state ownership and control. Schaeffle prefers the former.[1]

Among the remedies against cartell abuses, we may consider, finally, self-help. If organized, this may take two forms, (1) an anti-cartell, or consumers' association, and (2) a production association. The former, as we have had occasion to observe elsewhere, are specially important in the coal trade, and have been recognized for a long time as as an appropriate organization against the cartells.[2] The possibilities of self-help, as well as the most effective methods, depend on circumstances. Those consumers who have the good fortune to be in a competitive region, either do not need it, or can get fair terms by a proper organization.[3] The most effective form of self-help for the consumer is to acquire a direct supply of coal—*i. e.*, a coal mine. This method has been widely and very successfully adopted by the large industrial consumers, especially blast-furnaces, iron-works and shipping concerns. With good organization it could be extended doubtless to include consumers whose individual requirements are not great. But the smaller the consumers' demand, the less important, generally, is the variation in the supply and price of coal, and the greater the difficulty and drawbacks in getting a direct supply.[4]

[1] Schaeffle, pp. 664, 683–690.

[2] Huckinghaus, p. 48.

[3] *Cf.* Enquete, pp. 433–4.

[4] It is a demonstrable fact that many of the manufacturers who cry the loudest over the high price of coal could not show any appreciable difference in profits through an advance of coal prices by 50 per cent.

CONCLUSION

In the foregoing account, the writer has endeavored to treat the subject in as objective a manner as possible, and to present the facts with a sufficient degree of completeness to enable the reader to draw his own conclusions. For various reasons, which it is not necessary to enumerate here, the writer feels under obligation to present his conclusions on the matter also.

The principal questions which call for a verdict are concerning the policy of the cartells in respect to production and price, the effects on German industry, the position of labor and the need of regulation and reform.

The German coal cartells have not had an injurious influence, in general, on the production of coal. More particularly they cannot be accused, justly, of unduly limiting production among themselves. Nor have they attempted to accomplish the same end by crushing outside competition, by unfair methods. It would be preposterous to say that they have hindered technical progress. The cost of production, on the other hand, probably has been somewhat increased by the preservation of weak and costly mines through participation in the cartells.

In regard to prices, the policy of the coal cartells, on the whole, has been moderate, taking circumstances into consideration, while the policy of the coke cartell may be fairly pronounced extortionate. The prices of coal have been more stable than they would have been under free competition; during the *hausse* they were not screwed up so high as they might easily have been, but, on the other hand, they have not declined so quickly with the *baisse*. The like may be said of the coke

prices, but, at the same time, they were exorbitant considered from the point of view of costs and profits. In this respect a cartell system has the opportunity of greatly improving on free competition, from the point of view of social interest, but conflict of interest in some cases and lack of foresight in others may bring about a policy which is socially more injurious. At present the prices of both coal and coke seem too high, though not exorbitant.

The *déroute* of the iron industry was not due to the coal or coke cartells in any important degree, *i. e.*, even with low prices, disaster to the iron industry would have been inevitable. No other industry was affected so much as iron, and it is at least very questionable whether the cartells in general, (excluding the coal cartells in particular) are to be blamed for the crisis. This question is really beyond the scope of the present inquiry, but the opinion is advanced that most of the cartells helped, on the whole, to produce and to prolong the *hausse*, and among these cartells, undoubtedly, the coal and iron cartells were of great importance. This was due to the fact that they seemed to give a better guarantee of future prosperity. That they are to be blamed for the ill-judged over-development of certain industries, which was apparently the real cause of the crisis, does not seem to be a just conclusion. On the other hand, the cartells may be accused, with more probability of truth, of retarding the convalescence of German industry by not reducing prices, and, if this is true, the coal and coke cartells are specially to blame. In the opinion of the writer, this is very probable in the sense that moderately cheap coal and coke prices, though they might at first have merely stimulated certain consumers to further competitive extravagances, would

have had a distinctly beneficial result on the whole, and, in particular, would have given a sense of relief to the general situation which would have been of more social utility than the satisfaction and confidence which depended on the steadiness of the coal-mining revenues.

So far as the low export price policy is concerned, the writer has already intimated his opinion that its effect on German industry has been greatly exaggerated by its opponents. It seems to have been carried to excess in many instances, but not to such an extent as to seriously affect German industry. This is asserted, of course, only of coal and coke; for iron manufactures the abuse was much greater. The export premium policy, which was intended to off-set the low export price policy, cannot be considered as an equivalent, although, under the circumstances, a desirable relief.

The policy of the cartells towards the dealers has not developed far enough to make a general judgment appropriate. It may be taken to represent an extension of their monopolistic control, but if the coal cartells did not seize it, the dealers probably would, so that for the general consumer the question is, first, are costs reduced by the elimination of middlemen, and, second, is there any organization possible, to oppose the strict monopoly of sale. To this the answer may be given that the organization of the system of sale certainly offers opportunity for economies in distribution. Appropriate combinations of consumers, though difficult, seem quite within the range of possibility as a useful counterweight to the cartells. In one respect these cartells show on the whole, a virtue too often lacking elsewhere, namely, equal treatment of customers.

In relation to labor the cartells have only an indirect significance, but their history and policy in the coal in-

dustry up to the present date shows nothing of hostility or immediate danger. Nevertheless prudence on the part of the laborer demands thorough organization in the form of trades-unions.

On the whole, we may say that the shortcomings of the coal cartells (even in price policy) have been due rather to weakness of organization or inexperience in management than to inherent defects in the system. Danger and weakness will be present in any form of organization, and the greatest danger with the cartell system is a policy of extortion, and it is often, perhaps generally, a sign of weakness in leadership. The proper price policy of a cartell such as the coal cartells in Germany is not strictly stable prices, but stable prices for definite, limited terms. Permanent prices are an absurdity, owing to the unavoidable changes in cost of production, supply and demand. The cartell should keep prices, where possible, at a point of very moderate profit in periods of industrial depression, and be content with a handsome, though not exorbitant, profit during a boom. In both cases it should respond to the market needs.[1] Hence contracts should be limited at the maximum to a year.

Cartells cannot hope to prevent crises or great changes in the markets. This is obviously true at present, and is also true for any period for which economic predictions as to industrial organization have any scientific or practical value. This is so, because, first, the world is very unevenly developed industrially and commercially and in the organization and co-ordination of these elements; second, there is no possibility of controlling the production of the most funda-

[1] Wages on the other hand (though they should be at all times adequate) ought not to vary with the price of the commodity produced, but according to the market for labor.

mental industry, *viz.*, agriculture; third, equilibrium of market conditions, or control of market conditions, requires a control of demand as well as supply, and this is not only uncontrollable, but very uncertain; fourth, controllable accommodations to changes in the market on the side of production must be too slow, owing to the immobility of capital and labor; fifth, the problem of organization is altogether too vast, even in an isolated state, to say nothing of the infinitely greater difficulties of the whole world.

In respect to regulation and reform, the demand for a greater amount of information seems to be justified and should be insisted upon by the German and Prussian governments. They should have the most complete information, regarding such questions as costs, markets and amounts sold, pooling contracts, exclusive contracts, discriminations in conditions or prices, domestic and foreign, gross and net profits, dividends and wages, etc. This is probably not much in excess of what the governments have actually obtained from the coal cartells. It is not necessary, of course, that all this information should be divulged to the public. The public may claim unconditionally such part of that information as does not affect the property interests of the producers, or the interests of national industry, a wider claim for information should have special justification. Of course, the line here is not definite, nor can it be so from the nature of the case. Hence there must be some administrative discretion.

So far as the German coal cartells are concerned, none of the other remedies proposed seem to promise much *at present*. Criminal and civil legislation are inappropriate. Administrative control, beyond publi-

city, is premature. The economic remedies are either too incomplete, or carry with themselves disadvantages which outweigh the advantages. The acquisition of coal mines in the Ruhr by the Prussian fiscus seems a desirable experiment, and under fortunate conditions of purchase might be carried further, but it must not be regarded so much as a remedy against exploitation of the consumer as a means of making the government freer in supplying its own wants, and in giving it a check on the industry of that region.[1]

Of course it would be unfair and impolitic to single out the cartells in one industry for regulation to the exclusion of others, where equally good grounds for intervention existed. Although the coal cartells have been the most loudly denounced, there does not seem to be sufficient basis in fact for such an invidious distinction.

[1] According to the most recent information, the Prussian fiscus is is making a determined effort to buy Hibernia, the third largest coal company, but the financial interests opposed to the entry of the fiscus in that district are equally determined to make it pay a high price for the same. This seems to be a shrewd move, which aims to give the fiscus such a high cost of production that it cannot assume an independent price policy.

BIBLIOGRAPHICAL REFERENCES WITH FULL TITLES

Abgeordnetenhaus—Stenographische Berichte ueber die Verhandlungen des Preussischen Hauses der Abgeordneten.

Aeltesten d. Kaufmannschaft v. Berlin—Bericht ueber Handel und Industrie von Berlin nebst einer Uebersicht des Aeltesten-Kollegiums erstattet von den Aeltesten der Kaufmannschaft von Berlin.

Arndt: Bergbau und Bergbaupolitik. Leipzig, 1894.

Arndt: art. Bergbau, Handwörterbuch der Staatswissenschaften, 1899.

Auswärtiger Handel des Deutschen Zollgebiets.

Berg-Hütten-u. Salinen—Zeitschrift für das Berg-Hütten und Salinenwesen.

Bericht d. Cokssyndicats—Geschäfts-Bericht. A. G. Westfälisches Cokssyndicat.

Bericht d. Kohlensyndicats—Bericht des Rheinisch-Westfälischen Kohlensyndicats.

Berlin Hk.—Jahresbericht der Handelskammer zu Berlin.

Berliner Tageblatt.

Biermer: art. Unternehmerverbände Wörterbuch der Volkswirtschaft.

Bochum Hk.—Jahresbericht der Handelskammer zu Bochum.

Brentano: Ueber die Ursachen der heutigen socialen Noth. Leipzig, 1889.

Breslau Hk.—Jahresbericht der Handelskammer zu Breslau.

Bücher: Die wirtschaftlichen Kartelle. Schriften des Vereins für Sozial Politik. Bd. 61.

Brüsseler Vertrag über die Behandlung des Zuckers vom 5 März, 1902, und Entwurf eines Gesetzes wegen Abänderung des Zuckersteuergesetzes mit Denkschrift und Anlagen. Berlin, 1902.

Buff: Die Gesetze und Verordnung betreffend den Betrieb der Bergwerke in Preussen. Essen, 1894.

Bulletin Trimestriel de la Société de L'Industrie Minérale. St. Étienne, 1903.

Calwer: Handel und Wandel.

Cent. Verb. D. I.—Verhandlungen, Mittheilungen und Berichte des Centralverbandes deutscher Industrieller.

Coal Trade Journal.

Cohn: Ein Beitrag zur Geschichte der wirtschaftlichen Kartelle. Archiv für soziale Gesetzgebung und Statistik, 1895.

Colliery Guardian.

Comité Central des Houillères de France. Annuaire.

Conrad: Grundriss zum Studium der politischen Oekonomie. Jena, 1900.

Cartell Comité—Stenographisches Protokoll, Cartell Comité des Industrierathes. Am 17 April, 1901. (Wien).

Denkschrift ueber die Kohlenfrage—Denkschrift betreffend die Verhandlungen des Deutschen Reichstages ueber die Kohlenfrage. Bearbeitet vom Verein für die bergbaulichen Interessen im Oberbergamtsbezirk Dortmund. Essen, 1901.

Denkschrift der Prager Handelskammer—Denkschrift der Handels- und Gewerbekammer in Prag gerichtet an das k. k. Handelsministerium in Betreff der staatlichen Regelung des Cartellwesens. Prag, 1896

Denkschrift ueber die Untersuchungen der Arbeiter-und Betriebs-Verhältnisse in den Steinkohlen-Bezirken. Bearbeitet im Auftrage der Minister der öffentlichen Arbeiten und des Innern. Berlin, 1890.

Dortmund Hk.—Jahresbericht der Handelskammer zu Dortmund.

Dortmunder Jahrbuch.—Jahrbuch für den Oberbergamtsbezirk Dortmund. Essen, 1901.

Dortmunder Zeitung.

Düsseldorf Hk.—Bericht der Handelskammer zu Düsseldorf.

Effertz (1891), Was sind "normale" Kohlenpreise? Essen, 1891.

Effertz (1894), Der niederrheinisch-westfälische Kohlen-Bergbau im I Semester des Jahres, 1894. Essen, 1894.

Effertz (1895), Die niederrheinisch-westfälische Kohlen-Industrie in ihren Existenz-Bedingungen früher und jetzt. Essen, 1895.

Enquete—Kontradiktorische Verhandlungen ueber Deutsche Kartelle. Die vom Reichsamt des Innern angestellten Erhebungen ueber das inländische Kartellwesen in Protokollen und stenographischen Berichten.

Heft 1 : Das Rheinisch-Westfälische Kohlen-Syndicat.

Heft 2 : Verhandlungen ueber die Oberschlesische Kohlen. Konvention und das Rheinisch-Westfälishe Kohlensyndikat.

Heft 3 : Verhandlungen ueber das Westfälische Kokssyndikat. Berlin, 1903.

Heft 5 : Verhandlungen über die rheinisch-westfälischen Roheisensyndikate.

Heft 6 : Verhandlungen über den Halbzeug-Verband. Berlin, 1904.

Entscheidungen des Reichsgerichts in Civilsachen. Leipzig.

Essen Hk.—Jahresberichte der Handelskammer für den Kreis Essen.

Festenberg-Packisch : Bausteine zur Geschichte des deutschen Bergbaus. Leipzig, 1901.

Frankfurter Zeitung.

Franz : Die industriellen Syndicate und Cartelle. Berlin, 1902.

Fridrichowizc : Kartelle. Zeitschrift für die gesamte Staatswissenschaft. 1895.

Friedrich : Schlesiens Industrie unter dem Einflusse der Caprivischen Handelspolitik, 1889–1900. Berlin, 1902.

Fechner: Geschichte des schlesischen Berg- und Hüttenwesens. Zeitschrift für das Berg Hütten-u. Salinen-Wesen, 1902.
Haacke: Handel und Industrie der Provinz Sachsen, 1889–1899. Stuttgart, 1901.
Hamburgs Handel.
Hamburg Hk —Jahresbericht der Handelskammer zu Hamburg.
Handels-Museum.
Heine: Koalitionsrecht und Erpressung. Archiv für Soziale Gesetzgebung und Statistik. Bd. 17. (1902).
Hirsch: Die rechtliche Behandlung der Kartelle. Jena, 1903.
Hitschmann: Kartelle und Staatsgewalt. Wien, 1897.
Huber: Die Kartelle. Leipzig, 1903.
Huckinghaus: Die Verstaatlichung der Steinkohlenbergwerke. Jena, 1892.
Gesetz-Entwurf btr. d. Verbot d. Rübenrayonnirung.—Regierungsvorlage. Gesetz vom . . . betreffend das Verbot der Rübenrayonnirung und die Lieferung der zur Zuckererzeugung nöthigen Rübe. 1678 der Beilagen zu den stenogr. Protokollen des (österr.) Abgeordnetenhauses. XVII Session, 1903.
Glückauf, Berg- und Hüttenmännische Wochenschrift.
Gothein: Sollen wir unseren Bergbau verstaatlichen? Breslau, 1890.
Grossmann: Ueber industrielle Kartelle. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft, 1891.
Grünberg: Der oesterreichische Kartellgesetzentwurf. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft, 1897.
Gruner and Fuster: Aperçu Historique sur les Syndicats de Vente des Combustibles dans le Bassin Rhenan-Westphalien. Paris, 1898.
Grunzel: Ueber Kartelle. Leipzig, 1902.
Hundt: Geschäftliche Lage des Steinkohlen-Bergbaues. Mittheilungen über den niederrheinisch-westfälischen Steinkohlen-Bergbau. VIII Allgemeinen Deutschen Bergmannstag. 1901.
Hundt: Arbeiterwohnungen auf den Zechen des Ruhrreviers. Ib.
Industrie-Zeitung. Deutsche Industrie-Zeitung. Organ des Centtralverbandes Deutscher Industrieller.
Jahrbuch für das Bergbau-und Hüttenwesen im Königreich Sachsen.
Jahresbericht der Landwirtschaftskammer für die Rheinprovinz.
Jahresbericht des Vereins. Dortmund.—Jahresbericht des Vereins für die bergbaulichen Interessen im Oberbergamtsbezirk Dortmund.
Juliusberg: Die Kartelle und die deutsche Kartellgesetzgebung. Berlin, 1903.
Juristentag—Verhandlungen des Sechsundzwanzigsten Deutschen Juristentages. Berlin, 1903.
Kanitz-Podangen: Die Kohlen-Verkaufsvereine. Berlin, 1891.
Kartell-Rundschau. Zeitschrift für Kartellwesen und verwandte Gebiete.
Kestner: Die deutschen Eisenzölle. Leipzig, 1902.
Kleinwächter: Die Kartelle. Innsbruck. 1883.

Kleinwächter : art. Kartelle, Handwörterbuch der Staatswissenschaften. Jena, 1900.
Köhner : Arbeiterverhältnisse. VIII Allgemeine Deutsche Bergmannstag. 1901.
Kölnische Volkszeitung.
Kölnische Zeitung.
Koepper : In Plutos Reich. Wanderungen durch Schacht und Hütte im rheinisch-westfälischen Industriebezirk. Berlin, o. J.
Kuhlo : Die Kartellfrage. München, 1903.
Laur : De l'Accaparement. Paris, 1903.
Landesberger : Der österreichischen Cartellgesetzentwurf. Zeitschrift für das Privat-und öffentliche Recht der Gegenwart. Bd. 24. 1897.
Landesberger : Welche Massregeln empfehlen sich für die rechtliche Behandlung der Industrie-Kartelle? Verhandlungen des Sechsundzwanzigsten Deutschen Juristentages. Berlin, 1902.
Landwirtschaftskammer für die Rheinprovinz. Jahres-Bericht, 1900.
Lehr und Frankenstein : Production und Konsumption in der Volkswirtschaft. Leipzig, 1895.
de Leener : Les Syndicats Industriels en Belgique. Bruxelles, 1903.
Lexis : art. Steinkohlen, Handwörterbuch der Staatswissenschaften.
Liefmann : Krisen und Kartelle. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft. 26 Jahrgang. (Schmoller's Jahrbuch).
Liefmann : Schutzzoll und Kartelle. Jena, 1903.
Liefmann : Die Unternehmerverbände. Freiburg, i. B. 1897.
Liefmann : Was kann heute den Kartellen gegenüber geschehen? Conrad's Jahrbücher. Nov., 1902.
Liefmann : Zur Frage eines Kartellgesetzes. Soziale Praxis. Jan. 3, 10, 1901.
Lueger : art. Kohlen, Lexikon der gesammten Technik. Bd. II. Berlin, 1895.
Lotz : Sonderinteressen gegenueber der Wissenschaft einst und jetzt. Berlin, 1902.
Lozé : Les Charbons Britanniques. Paris, 1900.
May : Die Wirtschaft in Vergangenheit, Gegenwart und Zukunft. Berlin, 1901.
Menzel : Die Kartelle und die Rechtsordnung. Leipzig, 1902.
Mittelfranken Hk.—Jahresbericht der Handels- und Gewerbekammer für Mittelfranken.
Monatliche Nachweise u. d. Auswärtigen Handel—Monatliche Nachweise ueber den Auswärtigen Handel des Deutschen Zollgebiets.
Münchener Allgemeine Zeitung.
Nationalsoziale Verein, 1902.—Protokoll ueber die Verhandlungen des Nationalsozialen Vereins zu Hannover, 1902. Berlin, o. J.
Oberbayern Hk.—Jahresbericht der Handels- und Gewerbekammer für Oberbayern.
Oberschlesischer Anzeiger.

Oeser: Wie stellen wir uns zu den Kartellen und Syndikaten? Frankfurt a/M. 1902.

Oesterr. Kartell-Gesetz-Entwurf—Regierungsvorlage . . . ueber Cartelle in Beziehung auf Verbrauchsgegenstände, die einer mit der industriellen Production in enger Verbindung stehenden indirecten Abgabe unterliegen. 154 der Beilagen zu den stenogr. Protokollen des Abgeordnetenhauses. XV Session, 1898.

Oldenburg: Studien ueber die rheinisch-westfälische Bergarbeiterbewegung. Schmollers Jahrbuch. Bd. 14 (1890).

Oppeln Hk.—Jahresbericht der Handelskammer für den Regierungs-Bezirk Oppeln.

Parteitag, der Sozialdemokratischen Partei, 1894. Protokoll ueber die Verhandlungen des Parteitages der Sozialdemokratischen Partei Deutschlands. Berlin, 1894.

Perquel: La Crise du Charbon en Allemagne. Paris, 1900.

Peters: Die finanzielle Entwickelung der preussischen Binnenwasserstrassen. Archiv für Eisenbahnwesen, 1902.

Philippovich: Grundriss der Politischen Oekonomie. Freiburg, i. B., 1899.

Pieper: Die Lage der Bergarbeiter im Ruhrrevier. Berlin, 1903.

Pohle: Die Kartelle der gewerblichen Unternehmer. Leipzig, 1898.

Prusmann: Denkschrift ueber den Entwurf eines Rhein-Elbe-Kanals. Berlin, 1899.

Raffalovich: Trusts, cartels & syndicats. Paris, 1903.

Renauld: Die Bergbau-und die Hüttenindustrie von Oberschlesien. 1884–1897. Stuttgart, 1900.

Reich: Referentenentwurf eines Gesetzes, betreffend die Regelung des Cartellwesens. Industrie und Landwirtschaftsrath. Wien, 1901.

Reichstag, Protokoll: Stenographische Berichte ueber die Verhandlungen des Reichstags.

Rheinisch-Westfälische Zeitung.

Riehn: Das Konsumvereinswesen in Deutschland. Berlin, 1902.

Rosenberg: Das Cartellgesetz. Zeitschrift für Staats- und Volkswirtschaft. Jahrgang, 1897. Juni, 6, 13 u. 27.

Rottenburg: Die Kartellfrage. Leipzig, 1903.

Rousiers: Les Syndicats industriels des producteurs en France et à l'étranger. Paris, 1901.

Saarbrücken Hk.—Jahresbericht der Handelskammer zu Saarbrücken.

Saling's Börsen Jahrbuch.

Sarter: Die Syndikatsbestrebungen im niederrheinisch-westfälischen Steinkohlenbezirke. Jahrbücher für Nationaloekonomie und Statistik, 1894.

Savoye: La Crise du Charbon, 1899–1900. Paris, 1901.

Sayous: La Crise Allemande de 1900–1902. Le Charbon, Le Fer & L'Acier. Paris, 1903.

Schacht: Der Stahltrust. Preussische Jahrbücher. 1903.

Schaeffle: Trennung von Staat und Volkswirtschaft aus Anlass des jüngstens Arbeitmassenaustandes im Kohlenbergbau. Zeitschrift für die gesamte Staatswissenschaft. 1889.

Schleper: Das Volkseigenthum an den Bergwerken. Wien, 1900.

Schmoller: Grundriss der allgemeinen Volkswirtschaftlehre. I Leipzig, 1900.

Schneider: Entwickelung des niederrheinisch-westfälischen Bergbaus und der Eisenindustrie. Bochum, 1899.

Schoenlank: Die Kartelle. Archiv für Soziale Gesetzgebung und Statistik. 1890.

Sinzheimer: Ueber die Grenzen der Weiterbildung des fabrikmässigen Grossbetriebes in Deutschland. Stuttgart, 1893.

Sombart: Der Moderne Kapitalismus. Leipzig, 1902.

Soziale Praxis.

Statistisches Jahrbuch—Statistisches Jahrbuch für das Deutsche Reich.

Statistik d. Oberschles. Berg- u. Hütten.—Statistik der oberschlesischen Berg- und Hüttenwerke. Herausgegeben vom oberschlesischen Berg und Hüttenmännischen Verein. Kattowitz.

Statut, Cokssyndicat—Statut der A. G. Westfälisches Cokssyndicat vom . . . 31 Okt. 1899.

Statut, Kohlensyndicat—Gesellschafts-Vertrag (Statut) der A. G. Rheinisch-Westfälisches Kohlensyndicat.

Stahl und Eisen. Zeitschrift für das deutsche Eisenhüttenwesen.

Steinbach: Der Staat und die modernen Privatmonopole. Kartell-Rundschau, Heft I. 1903.

Steinkohlenzechen des niederrheinisch-westfälischen Industriebezirks. 1903. Dortmund 1903.

Steinman-Bucher: Ausbau des Kartellwesens. Berlin, 1902.

Steinmann-Bucher: Des Rheinisch-Westfälische Kohlensyndicat. Schriften des Vereins für Sozial-Politik. Bd. LX. Leipzig, 1894.

Steinmann-Bucher: Wesen und Bedeutung der gewerblichen Kartelle. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft. 1891.

Stieda: Kartelle. Schriften des Vereins für Sozialpolitik. Bd. LXI. (1894).

Sympher: Die wirtschaftliche Bedeutung des Rhein-Elbe Kanals. Berlin, 1899.

Tschierschky: Kartell und Trust. Göttingen, 1903.

Uebersicht ueber die auf den Preussischen Staatseisenbahnen im Güterverkehr bestehenden Ausnahmetarife, 1901.

Urban: Bericht des Referenten enthaltend Vorschläge für eine gesetzliche Regelung des Kartellwesens in Oesterreich. Industrie und Landwirtschaftsrath, Wien, 1901.

Vertrag, Cokssyndicat u. Kohlensyndicat.—Vertrag zwischen der A. G. Rheinisch-Westfälisches Kohlensyndicat zu Essen und der A. G. Westfälisches Cokssyndicat zu Bochum. 1897.

Vertrag, Kohlensyndicat—Wortlaut des Vertrages zwischen der A. G. Rheinisch-Westfälisches Kohlen-Syndicat und den zum Syndicat gehörigen Zechen sowie zwischen den letzteren untereinander. 1895.

Verzeichnis der Bergwerke, Salinen, industriellen Werke und Ortschaften nach ihrer Lage auf der "Industrie und Verkehrskarte des Niederrheinisch-Westfälischen Industriebezirks. Essen.

Verzeichnis der Vereine gewerblicher Unternehmer—Verzeichnis der im Deutschen Reiche bestehenden Vereine gewerblicher Unternehmer. Berlin, 1903.

Vierteljahrshefte — Vierteljahrshefte zur Statistik des Deutschen Reichs.

Villain: Le fer, la houille, et la métallurgie. Paris, 1901.

Voelcker: Bericht über das Kartellwesen in der inländischen Eisen industrie. Berlin, 1903.

Vogelstein: Die Industrie der Rheinprovinz, 1888–1900. Stuttgart, 1902.

Waentig: Industriekartelle und Trusts und das Problem ihrer rechtlichen Regelung. Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft. Bd. 25 (1901).

Weiskirchner: Das Cartellwesen vom Standpunkte der christlichen Wirtschaftsauffassung. Wien, 1896.

Wieser: Die rheinisch-westfälische Eisenindustrie in der gegenwärtigen Krisis. Schmoller's Jahrbuch. Bd. 26 (1902).

Wittelshöfer: Der österreichische Kartellgesetzentwurf. Archiv für soziale Gesetzgebung und Statistik. Bd. 13 (1899).

X. Kommission—Bericht der X. Kommission zur Vorberathung des Antrages Dr. v. Korn-Rudelsdorf und Genossen betreffend die Missstände bei dem Verschleiss der Kohlenproduktion, Nr. 12 der Drucksachen. Haus der Abgeordneten, 19 Legislaturperiode III Session 1901. Nr. 145.

Zeitschr. f. Braunkohlen—Zeitschrift für Gewinnung und Verwertung der Braunkohlen.

Zeitschr. oberschles. Berg-und Hütt. Ver.—Zeitschrift des oberschlesischen Berg-und Hüttenmännischen Vereins.

Zeitschr. Preuss. Stat. Bureaus. Zeitschrift des Königlich Preussischen Statistischen Bureaus.

Zeitung des Vereins Deutscher Eisenbahn-Verwaltungen.

PUBLICATIONS

OF THE

AMERICAN ECONOMIC ASSOCIATION

THIRD SERIES.
VOL. V, NO. 4.

ISSUED QUARTERLY.
PRICE, $4.00 PER YEAR.

THE INFLUENCE OF FARM MACHINERY

ON

PRODUCTION AND LABOR

BY

H. W. QUAINTANCE, D.C.L., PH.D.

NOVEMBER, 1904

PUBLISHED FOR THE
AMERICAN ECONOMIC ASSOCIATION
BY THE MACMILLAN COMPANY
NEW YORK
LONDON: SWAN SONNENSCHEIN & CO.

Copyright, 1904, by
AMERICAN ECONOMIC ASSOCIATION

PRESS OF
ANDRUS & CHURCH
ITHACA, N. Y.

PREFACE

The subject of this thesis was suggested to me by my former teacher, Professor David Kinley, of the University of Illinois. Credit for helpful suggestions and inspiration is due also to Col. Carroll D. Wright, formerly U. S. Commissioner of Labor; to Professor I. P. Roberts, of Cornell University; to the members of Professor Ely's seminary in economics in the University of Wisconsin, during the school-year 1902–03; and to the members of the Publication Committee of the American Economic Association. To Professor M. B. Hammond, now of the Ohio State University, I am indebted not only for helpful suggestions made during the two years I was a student in the University of Illinois, but also for a most severe yet kindly criticism of the paper after I thought I had it finished.

In the preparation of the paper I have been careful to avoid trying to prove a theory, preferring rather to let the data tell their own story.

H. W. QUAINTANCE.

University of Missouri,
Columbia, Mo.

TABLE OF CONTENTS

PART I.—HISTORICAL SURVEY

PAGE

When the change from hand to machine methods took place ... 1
Hand methods compared with machine methods ... 2
Output of farm machinery ... 11

PART II.—MACHINERY AND PRODUCTION

Chap. 1. The course of agricultural production contrasted with the increase in the population, 1840–1900 ... 12
The principal crops as shown by the reports of the Census ... 12
The relative growth of the population and the cereal production ... 13
Chap. 2. Concerning the increase in cultivated area per farm worker and the greater effectiveness of farm workers when aided by machinery as shown by statistics of the Census ... 15
Chap. 3. Concerning the greater effectiveness of farm workers when aided by the use of machinery as shown by statistics of the Department of Labor ... 19
Chap. 4. The cost of production by hand and by machine methods 23
Certain of the principal crops ... 25
Farm crops generally ... 26
Chap. 5. Influence of machinery upon fluctuations in quantity of product ... 27
Chap. 6. Influence of machinery upon the quality of products ... 28

PART III.—MACHINERY AND LABOR

Chap. 1. The saving of labor ... 29
Labor saving effect of machinery in the production of the nine principal crops ... 29
Chap. 2. The displacement of labor ... 30
The absolute displacement ... 31
In all farm work in the New England States ... 31
In the work of producing the nine principal crops 32
The relative displacement ... 34
In the different geographical divisions of the country 34
Extent of the relative displacement ... 36
The shifting of the people among the different occupation classes ... 37

Machinery the cause of displacements 39
The displaced workmen 40
Effect of machinery upon the number of persons in gainful occupation classes 42
Chap. 3. The agricultural work of former times in the towns of to-day 43
Chap. 4. The influence of machinery upon the size of farms and the resulting relationship between the dependent and independent farming classes 47
The average acreage of all land per farm 47
The average acreage of improved land per farm 48
The average acreage in crops per farm 49
The influence of machinery in the seven leading cereal-producing States 51
The average crop acreage per farm 54
The average crop acreage per person 55
Relative growth of the dependent and independent classes 55–56
Average value of farms 58
Chap. 5. Wages under hand and under machine methods of production 59
Daily wages 59
The position of the unskilled workman 62
Monthly wages 64
In time of hand methods 64
For the period 1866–1902 65
Sympathetic variations in wage rates 68
Chap. 6. The influence of machinery upon the life and general welfare of the independent farm operators 69
The improved condition of farm workers generally 69
The work of women on farms 74
Chap. 7.–The influence of machinery upon the physical and mental nature of man 75
The purpose and effect of the use of machinery 75
Effect upon population 76
Routine work 78
The educating influence of machinery 81
Illiteracy and injuries due to the use of machinery in North Atlantic and Southern States as shown by returns of the Twelfth Census 83
Chap. 8. The use of machinery and the length of the working day 84
The purpose of the employer and the employee 84
The best length of working day for a machine 86
The best length of the working day for a man 86
The conflict of interest 89
The length of the working day on farms 90
Economic forces as affecting conditions of employment 91

TABLES OF REFERENCE

I. Total number of persons, ten years of age and over in the several occupation classes in 1870, 1880, 1890 and 1900 ... 93
II. Total number of males, ten years of age and over in the several occupation classes in 1870, 1880, 1890 and 1900 ... 94
III. Total number of females, ten years of age and over, in the several occupation classes in 1870, 1880, 1890 and 1900 ... 95
IV. Per cent. of persons in the several occupation classes of the total number of persons in occupation classes in 1870, 1880, 1890 and 1900 ... 96
V. Per cent. of males in the several occupation classes of the total number of males in occupation classes in 1870, 1880, 1890 and 1900 ... 97
VI. Per cent. of females in the several occupation classes of the total number of females in occupation classes in 1870, 1880, 1890 and 1900 ... 98
VII. Farming population in 1880, 1890 and 1900 ... 99
VIII. Farming population in the seven leading cereal producing States in 1880, 1890, and 1900 ... 100
IX. Agricultural population of New England in 1880, 1890 and 1900 ... 101
X. Acreage in all farm crops as reported in 1880, 1890, and 1900 ... 102
Index ... 105

PART I

HISTORICAL SURVEY

History tells of no time when farming was not a recognized occupation, when men have not toiled and sweated to wring from the soil their chief sustenance, and yet, it is only within the past hundred years that any considerable progress has been made in the invention of farm labor-saving machinery. There are scattered mentionings of earlier attempts to improve the means of doing farm work; as, for example, a passage in the writings Pliny the elder, in which he describes a machine propelled by oxen and used by the Gauls for cutting grain.[1] But such notices are rare, and whatever the merits of the various inventions, they seem not to have been perfected or at any rate not to have come into common use. The Independence of America found the farmers of Europe, as well as of this country, cultivating and caring for their crops by pretty much the same rude means and methods as were practiced by the Egyptians and Israelites three thousand years before.

As to just when the modern machine methods came into general use authorities differ and will, doubtless, continue to differ. The census statistician for agriculture makes the statement that "The year 1850 practically marks the close of the period in which the only farm implements and machinery, other than the wagon, cart, and cotton gin, were those which, for want of a

[1] "In the vast domains of the provinces of Gaul a large, hollow frame, armed with teeth and supported on two wheels, is driven through the standing corn, the beasts being yoked behind it; the result being that the ears are torn off and fall within the frame."—Pliny's Natural History; Bohn's Classical Library, Vol. IV, p. 103.

better designation, may be called implements of hand production."[1] This opinion is in substantial agreement with that of a recent German writer.[2]

The cotton gin was not invented until nearly twenty years after the Declaration of Independence was signed, and the wagons and carts of that time were crude affairs in comparison with those of the present day.[3] "The Massachusetts farmer who witnessed the revolution plowed his land with the wooden bull-plow, sowed his grain broadcast, and, when it was ripe, cut it with a scythe, and thrashed it out on his barn floor with a flail."[4] The poor whites of Virginia, in 1790, lived in log huts "with the chinks stuffed with clay; the walls had no plaster; the windows had no glass; the furniture was such as they had themselves made. Their grain was thrashed by driving horses over it in the open field. When they ground it they used a rude pestle and mortar, or, placed in the hollow of one stone, they beat it with another."[5]

"In parts of Pennsylvania, in Delaware, the eastern shores of Maryland and Virginia and, we believe, in Rhode Island grain was generally trodden out by oxen

[1] Twelfth Census, Agriculture I, p. xxix.

[2] "Andererseits ist der landwirtschaftlichen Maschinenentwickelung vor dem neunzëhnten Jahrhundert wenig Bedeutung beizumessen, da ihre praktische Anwendung mit ihr nicht Hand in Hand gegangen war. Daher kommt es auch, dass die Maschinen der vorigen Jahrhunderte alle mehr oder weniger unvollkommen blieben. Die Anwendung landwirtschaftlicher Maschinen erfolgte erst in grösseren Masstab um die vierziger Jahre dieses Jahrhunderts."—Bensing: Einfluss der landwirtschaftlichen Maschinen, p. 16.

[3] Mass. Agr. Report for 1853, p. 422.

[4] McMaster: History of the People of the United States, Vol I., p. 18.

[5] McMaster: History of the People of the United States, Vol. II, p. 14.

or horses as the more expeditious method," even later than the year 1800. "Horses were preferred for this work. A crop of three thousand bushels could thus be threshed and secured . . . . . in ten days. . . . . The treading floors were from forty to one hundred and thirty feet, more commonly sixty to one hunfeet in diameter with a path twelve to fourteen feet wide near the periphery upon which the grain was laid. The horses were led round at a slow trot in platoons equidistant from each other . . . . The floors were sometimes removed from field to field, but permanent floors made hard and smooth, and kept so by careful use, were preferred. They were commonly fenced round, sometimes with an outer and inner fence."[1]

Of the Georgia estates in 1790, it is said: Their "chief products were negroes, rice, and tobacco . . . . The staple was tobacco, and this was cultivated in the simplest manner with the rudest of tools. Agriculture as we now know it can scarcely be said to have existed. The plough was little used. The hoe was the implement of husbandry. Made at the plantation smithy, the blade was ill-formed and clumsy; the handle was a sapling with the bark left on . . . Few roads were ever marked by the tires of a four-wheeled wagon or a tumbrel. When the tobacco was ready for the inspector's mark, stout hogsheads were procured, the leaves packed in, the heads fastened in, a shaft and a rude axle attached, and, one by one they were rolled along the roads for miles to the tobacco-house nearest by."[2] Michaux, who made a journey through the United States in 1802 for the express purpose of study-

[1] Preliminary Report, Eighth Census, p. 95.

[2] McMaster: History of the People of the United States, Vol. II, p. 4.

ing agricultural conditions, in speaking of North Carolina, says: "Throughout the whole of the low country the agricultural labours are performed by negro slaves, and the major part of the planters employ them to drag the plough; they conceive the land is better cultivated and calculate besides that in the course of a year a horse, for food and looking after, costs ten times more than a negro, the annual expense of which does not exceed fifteen dollars."[1]

Even so late as the year 1812, the French settlers in Southern Illinois were using plows "made of wood with a small point of iron fastened upon the wood by strips of rawhide, the beam resting upon an axle and small wooden wheels. They were drawn by oxen yoked by the horns by raw leather straps, a pole extending back from the yoke to the axle." Small plows for plowing between the rows of corn were not introduced until about the year 1815. "They used carts that had not a particle of iron about them."[2]

The Cary plow, which seems to have been a fair type of the plows used during later colonial times and until well into the nineteenth century had a "wrought iron share, wooden landside and standard, and wooden mould board plated over with sheet iron or tin and short upright handles."[3] The Old Colony plow, which was still in general use in the Eastern States in 1820, "had a ten-foot beam and a four-foot landside" and it made the "furrows stand up like the ribs of a lean horse in the month of March."[4]

[1] F. A. Michaux, Travels in America in 1802, p. 291.

[2] Mass. Agr. Report for 1873–4, p. 18.

[3] Eighth Census, Agriculture, p. xviii. Mass. Agr. Report for 1853, p. 422.

[4] Year Book, Department of Agriculture (1899), p. 315.

One plow, in particular, is deserving of notice. It is the plow which Daniel Webster, in the year 1836, designed and helped to make for the especial purpose of clearing up a certain field on his farm at Marshfield, Massachusetts.[1] It was designed to cut a furrow from 12 to 14 inches deep and has been described as being "12 feet long from the bridle (*i. e.*, clevis) to the tip of the handles; the landside is 4 feet long; the bar and share are forged together; the mould board is of wood with straps of iron; breadth at heel of mould board to landside, 18 inches; the spread of the mould board was 27 inches; the lower edge of the beam was 2 feet 4 inches above the sole; width of share 15 inches." With oxen to draw the plow and several men to help him, Webster held the handles and cleared his stump patch. Speaking of his work with this plow, Webster is reported to have said: "When I have hold of the handles of my big plow in such a field as this, with four yoke of oxen to pull it through and hear the roots crack and see the stumps all go under the furrow, out of sight, and observe the clean mellow surface of the plowed land, I feel more enthusiasm over my achievement than comes from my encounters in public life at Washington."[2]

Webster's plow, although no doubt somewhat exceptional by reason of its massiveness, as became the man, is in fact, only an illustration of what was an every-day affair. For, the blacksmith shops were the plow factories of that time, and farmers were accustomed to having their plows made to order.

It must not be supposed, however, that inventors of the regular type were unmindful of the needs of the

[1] A picture of this plow is given in Roberts: Fertility of the land, page 49.

[2] N. Y. Agr. Report, 1867, p. 484.

farming class. The Napoleonic wars, in particular, stimulated the demand of Europe for American agricultural products and our patent office records furnish ample evidence of the efforts of inventors to supply better means of cultivating and caring for such products.[1] Whitney's cotton gin patented in 1794, was only one of many devices designed to promote the business of the farmer. At least two patents for grain thrashing machines were issued as early as the year 1791.[2] A patent for a corn planting machine was issued in 1799[3] and another for a grain cutting machine in 1803.[4]

But the only one of these early inventions, other than the cotton gin, which seems to have really foreshadowed its successor of the present day, was a cast-iron plow invented by Chas. Newbold of Burlington County, New Jersey. Sometime between 1790 and 1796, Newbold had a plow cast, under his direction, at the Hanover furnace, in Burlington County, New Jersey. The plow was cast all "in one peice" and on June 17, 1797, he was granted a patent for his invention.[5] He appears to have used this first plow on his own land with much success; but, financially, his enterprise was a failure. The farmers were opposed to "new fangled notions" and contended that the use of cast iron "poisoned the land, injured its fertility, and promoted the growth of weeds." Finally the point of the plow was broken off. It was never repaired, and the plow is now in the museum of the New York State Agricultural Society at Albany,

[1] Eighth Census, Preliminary Report, p. 96.

[2] Eighth Census, Preliminary Report, p. 96.

[3] U. S. Agr. Report for 1870, p. 401.

[4] Eighth Census, Agriculture, p. xx.

[5] U. S. Agr. Report (1870), p. 395; N. Y. Agr. Report (1867), p. 448.

New York.[1] Eventually, however, the prejudice against cast iron plows was overcome. Better patterns were devised. They were adopted by the people and so late as the year 1850, according to the Census statistician for Agriculture, "The old cast iron plows were in general use. Grass was mowed with the scythe, and grain was cut with the sickle or cradle and thrashed with the flail."[2]

The prototype of the modern grain reaper had indeed appeared prior to 1850.[3] A similar statement might, doubtless, be made concerning certain other inventions for which patents had been issued; but all of these, like the submarine boat and the flying machine of the present day, were in too imperfect a state, too complex, or too expensive to meet the demands of the time. Whitney's cotton gin and Newbold's cast iron plow may, therefore, be accepted as the only ones of the great inventions which, up to 1850, had become thoroughly incorporated into the agricultural industry of this country.

Just how soon after 1850 the various other labor saving machines became essential factors in the business of farm work it would be impossible to tell. Reaping machines were fairly well developed; but the complexity of the machines and the ignorance of the farmers were serious hindrances to their general use.[4] It is only in

[1] N. Y. Agr. Report (1867), pp. 446, 448.

[2] Twelfth Census, Agriculture, Vol. I, p. xxix.

[3] Obed Hussey's machine was patented in 1833; C. W. McCormick's in 1834.—Eighth Census, Agriculture, p. xxi.

[4] "I use for reaping only the scythe and cradle. . . . Perhaps a still greater benefit may be found in the substitution of reaping machines, which, even now, are used by most of the good farmers of my neighborhood. But because of their great liability to get out of order, the difficulties of working them, and especially my own ignorance of machinery, I have feared to attempt the use of reaping machines."—Letter of Edmund Ruffin, a Virginia farmer. Patent Office Reports (1850–51), p. 104.

very recent years that agricultural implement dealers have ventured to send out any reaping machine without sending also an expert operator to instruct the purchaser in its use.[1]

The two-horse corn cultivator began to come into use in 1861.[2] There are evidences, too, that other farm machines were coming into use at that time.[3] But during the Civil War from 1861 to 1864 the minds of inventors as well as of the working classes were given to other matters.[4]

From 1866 onward progress in the invention and use of agricultural machinery has been by more rapid strides, yet even so late as the year 1870 the editor of the "New American Farm Book"[5] questioned the advisability of using the large threshing machines because of the "great loss of grain and enormous waste of straw" which were apt to result, and cautioned his readers particularly against "employing itinerate threshers, who go about the country to do work." For the "moderate farmer" he advised the use of "a small single or double horse machine or hand thresher" as the more economical and as permitting the work to be done "in winter, where there is more leisure for it."

To-day the American farmer who does not use a machine of some sort is indeed far behind the times. The farmers of the far West have profited most of all.

[1] Report of the Industrial Commission, Vol. XI, p. 78.

[2] "*Illinois Farmer*" for 1861, p. 178.

[3] Eighth Census, Preliminary Report, p. 99.

[4] The Patent Office records through the period of the Civil War show a marked decrease in the number of patents issued for agricultural implements and machines and a very great increase in the number of patents issued for firearms and other weapons of warfare.

[5] R. A. Allen's "New American Farm Book" (published in 1870), p. 150.

There, on the California and Oregon farms, may be found fifty-horse-power traction engines in operation. Each one dragging "sixteen ten-inch plows, four six-feet harrows, and a press drill for planting seed-wheat. In this way one such engine performs the triple work of ploughing, harrowing, and planting, all in one operation. The saving of time is so great that one machine can plant with wheat, from fifty to seventy-five acres in a single day, mounting hilly and rough ground just as easily as when passing across dead levels." When the grain is ripe, a harvesting machine is, by the same means, pulled across the field. "Its cutters are often twenty to twenty-six feet wide . . . . When the cutters have performed their work, automatic rakers gather in the grain stalks and carry them to rows of knives where they are at once headed. Then, in the same operation, the wheat is threshed out, cleaned and sacked, and behind the great combination harvester there is left a trail of sacked wheat ready for the market. Another traction engine with a train of a dozen cars follows in the wake of the thresher and harvester, gathering up the wheat and carting it to the granary. In this manner fully seventy acres and more of wheat land are harvested in one day."[1] With the aid of these engines the work of "plowing, cultivating, seeding, and harvesting on farms of a thousand acres in extent" may be done by half a dozen men in "much less time than a whole army of employees could do the work on a farm of half the acreage."[2] For the profitable use of such vast machine power, large fields are a self-evident necessity.

[1] George E. Walsh, "Steam Power for Agricultural Purposes," in *Harper's Weekly*, Vol. XLV, p. 567.

[2] *Cassier's Magazine*, Vol. XIX, p. 139, and Harper's Weekly, Vol. XLV, p. 567.

The farm machines in use in the Central States are less massive and of a more varied nature and yet, in the rate of progress which they show, are no less wonderful than those above described. Instead of a hoe for covering seed-corn, dropped by hand, the farmer now uses a check-row planter drawn by horses and depositing the seed at regular intervals so that the rows may be cultivated with equal facility either in the direction of the planting or across. As a means of cultivating the corn, hoes are now laid aside, and in their stead the farmer quite commonly uses a riding plow. Steam power corn-huskers and corn-shellers are found. Instead of the old hand-method of shelling corn by scraping the ears against the handle of a frying pan or the blade of a shovel, by which means hardly six bushels could be shelled in a day, the farmer may now have his corn shelled at the rate of a bushel a minute and the machine which does the work will also "carry off the cobs to a pile or into a wagon, and deliver the corn into sacks."[1]

Mowing machines, horse hay-rakes, tedders, and stackers have revolutionized the work of making hay. It formerly required eleven hours of man-labor to cut and cure a ton of hay. Now the same work may be done in one hour and 39 minutes; while the cost for the required man-labor has been decreased from 83⅓ to 16¼ cents per ton.[2] Potato planters and diggers, feed choppers and grinders, manure spreaders, and ditch-digging machines are only a few of many labor-saving devices now common on the farms in the Central States. There is hardly a phase of farm work that has not been essentially changed by the introduction of some new implement or machine.

[1] Department of Agriculture, Year Book (1899), pp. 316–318 and 332.
[2] Department of Agriculture, Year Book (1899), p. 332.

Some idea of the great development which has taken place along these lines may be gained from a consideration of the value of the output of agricultural implements and machinery as reported to the Census Office. For purposes of comparative study, the figures must be taken subject to heavy allowances, because as pointed out by Mr. George K. Holmes,[1] the prices of farm machinery have "declined to an enormous extent," and this too, in spite of the fact that the later machines are more efficient, more durable, more readily operated, lighter, and stronger.

The total value of agricultural implements and machines manufactured during the several census years, as reported to the Census Office, is as follows:[2]

Year.	*Total for United States.*
1900	$101,207,428
1890	81,271,651
1880	68,640,486
1870	42,653,500[3]
1860	20,831,904
1850	6,842,611

[1] Twelfth Census, Manufacturing, IV, p. 353.

[2] Twelfth Census, Manufactures, Vol. IV, p. 344.

[3] The amount as given in the Census Report has been reduced to a gold basis.—See Tenth Census, Manufactures, p. 1.

PART II

MACHINERY AND PRODUCTION

THE COURSE OF AGRICULTURAL PRODUCTION CONTRASTED WITH THE INCREASE IN THE POPULATION 1840–1900

The first federal census which took account of agricultural products was that of 1840. The principal crops, for the period from 1840 to 1900 as reported to the census office, were as follows:[1]

Year.	*Barley bu.*	*Corn bu.*	*Cotton bales.*	*Hay tons.*
1899	119,634,877	2,666,440,279	9,534,707	84,011,299
1889	78,332,976	2,122,327,547	7,472,511	66,831,480
1879	43,997,495	1,754,591,676	5,755,359	35,150,710
1869	29,761,305	760,944,549	3,011,996	27,316,048
1859	15,825,898	838,792,742	5,387,052	19,083,896
1849	5,167,015	592,071,104	2,469,053	13,838,642
1839	4,161,504	377,531,875	1,580,958	10,248,108

Year.	*Oats bu.*	*Potatoes*[2] *bu.*	*Rye bu.*	*Wheat bu.*
1899	943,389,375	315,854,903	25,568,625	658,534,252
1889	809,250,666	261,496,623	28,421,398	468,373,968
1879	407,858,999	202,837,232	19,831,595	459,483,137
1869	282,107,157	165,047,297	16,918,795	287,745,626
1859	172,643,185	153,243,893	21,101,380	173,104,924
1849	146,584,179	104,066,044	14,188,813	100,485,944
1839	123,071,341	108,298,060	18,645,567	84,823,272

An examination of these figures shows that the barley crop of 1899 was 28.7 times greater than the barley crop

[1] The figures for the year 1839 are taken from the report of the Sixth Census, p. 408; those for the years 1849, 1859, 1869, 1879, and 1889 from the Eleventh Census, Agriculture, pp. 87-91; those for the year 1899 from the Twelfth Census, Agriculture, Vol. I, p. cxxi. The report of cotton production for the year 1839 was reported in pounds. The figures for that year have been converted to bales on the basis of five hundred pounds per bale.

[2] Includes both Irish and sweet potatoes.

of 1839; the corn, cotton, oats, wheat, and hay crops of 1899 were from 6 to 8 times greater than they were in 1839. The population of the United States in 1900 was, however, only 4.4 times greater than in 1840.

The total production of the eight principal cereals (corn, wheat, oats, barley, rye, buckwheat, rice, and Kaffir corn), expressed in bushels, and the population, as reported by the census authorities, for the period from 1840 to 1900, has been as follows:

Year.	*Population.*	*Cereals, bu.*
1900	75,568,686 [1]	4,434,698,746 [2]
1890	62,622,250 [1]	3,520,960,086 [2]
1880	50,155,783 [1]	2,699,415,752 [2]
1870	38,558,371 [1]	1,388,526,403 [2]
1860	31,443,321 [1]	1,242,159,398 [2]
1850	23,191,876 [1]	871,042,524 [2]
1840	17,069,453 [1]	617,321,778 [3]

If we represent the population in 1840 and the cereal production reported in that year, each by 100 and the population and cereal production reported in succeeding census years by their per cents, respectively, of the population and cereal production reported in 1840, we shall get a new table showing the relative increase in population and cereal production for the period in question. Such a table is presented herewith as follows:

Year.	*Population.*	*Cereals.*	*Increase in cereals over increase in population.*
1900	442.7	718.4	275.7
1890	366.9	570.4	203.5
1880	293.8	437.3	143.5
1870	225.9	224.9 [246.2]	[20.3] [4]
1860	184.2	201.2	17.0
1850	135.9	141.1	5.2
1840	100.0	100.0	. . .

[1] Twelfth Census, Population, I, p. xix.

[2] Twelfth Census, Agriculture, II, pp. 64–65.

[3] Sixth Census, p. 408.

[4] See p. 15.

From these figures it appears that in 1870 the proportion of cereal product to population was slightly below the proportion existing in 1840, but that otherwise there has been an increasingly greater proportion of product to population through the whole of the period from 1840 to 1900.[1]

The comparatively light cereal crop reported in 1870 was doubtless largely due to the unusually poor corn crop of that census year[2] and to the disordered conditions

[1] The following table, except the item of "all cereals," is compiled from bulletin No. 24, of the Division of Statistics, U. S. Department of Agriculture, on "Relations of Population and Food Products in the United States," and shows the per capita production of certain food products, as reported to the Census Office during the period from 1850 to 1900:

	1900	*1890*	*1880*	*1870*	*1860*	*1850*
Barley, bu.	1.57	1.25	.88	.77	.50	.22
Buckwheat, bu.	.15	.19	.24	.25	.56	.39
Corn, bu.	34.94	33.89	34.98	19.73	26.68	25.53
Oats, bu.	12.40	12.92	8.13	7.32	5.49	6.32
Rye, bu.	.34	.45	.39	.44	.67	.61
Wheat, bu.	8.66	7.48	9.16	7.46	5.51	4.33
Rice, lbs.	3.29	2.05	2.19	1.91	5.95	9.28
Potatoes, bu.	3.60	3.47	3.38	3.72	3.53	2.84
Sweet potatoes, bu.	.56	.70	.67	.56	1.34	1.65
Sugar, lbs.	6.54	5.34	5.09	3.45	10.09	14.29
Syrup and molasses, gal.	.58	.83	.93	.61	.74	.55
Pulse, bu.	.19	.15	.19	.15	.47	.40
Cattle, no.	.69[3]	.82	.72	.62	.81	.77
Swine, no.	.83	.92	.95	.65	1.07	1.31
Sheep, no.	.52	.57	.70	.74	.71	.94
All cereals, bu.	58.7	56.2	53.8	36.0	39.5	37.5

[2] Average yield per acre of cereal crops as estimated by the Department of Agriculture for the census years 1870, 1880, 1890 and 1900. (Bushels.)

Year.	*Corn.*	*Wheat.*	*Oats.*	*Barley.*	*Rye.*	*Buckwheat.*
1899	25.3	12.3	30.2	25.5	14.4	16.6
1889	27.0	12.9	27.4	24.3	13.1	14.5
1879	29.2	13.8	28.7	24.0	14.5	20.5
1869	23.6	13.6	30.5	27.9	13.6	16.9

Department of Agriculture, Year Book (1899), pp. 759–763.

[3] Cattle over one year.

then existing in the Southern States. Some allowance should, doubtless, be made also, in the table as a whole, for changes in the proportion of the several cereal products to the total cereal product.

In the matter of the corn crop reported upon by the census of 1870, it is interesting to note how differently the figures would appear had the yield for that year been a normal one. The average yield of corn, for that year, as estimated by the Department of Agriculture, was 23.6 bushels; but the average for the previous year was 26.0 bushels and that for the succeeding year was 28.3 bushels.[1] The medium between the averages for the next preceding and next succeeding years is 27.1 bushels. With an average yield per acre of corn equal to this medium number the cereal product for the census year 1870 would have been increased by 131,177,939 bushels and the index number representing the cereal production of that year, instead of being 224.9 would have been 246.2. If this latter number be substituted in the column of index numbers for cereal production, there will appear an unbroken increase in the proportion of cereal products to population, during the whole of the period under consideration.[2]

CONCERNING THE INCREASE IN CULTIVATED AREA PER FARM WORKER AND THE GREATER EFFECTIVENESS OF FARM WORKERS WHEN AIDED BY THE USE OF MACHINERY, AS SHOWN BY REPORTS OF THE CENSUS OFFICE

The census office statistician for agriculture presents a table as follows:[3]

[1] Department of Agriculture, Year Book (1899), p. 759.

[2] See the right hand column of figures in the table of index numbers, p. 13.

[3] Twelfth Census, Agriculture, I, p. xxxi.

Items.	*1900.*	*1890.*	*1880.*
Number of males in agriculture .	8,771,181	7,787,539	7,075,983
Number of horses, mules and asses	20,099,826	17,264,999	12,170,296
Acres of land in specified crops .	272,304,111	214,523,412	164,830,442
Average number of acres to one male worker	31.0	27.5	23.3
Average number of acres to one horse	13.5	12.4	13.5
Average number of horses to one male worker	2.3	2.2	1.7

Farther on, speaking with reference to this table, he says: "The number of acres of leading crops per male worker steadily increased, while the number per working animal was substantially the same in 1900 as in 1880. The increase in the productiveness of man's labor, therefore, is secured by the increased utilization of the power of the horse and mule in driving farm machinery. The figures of the table indicate two important changes in the twenty years. One of these appears in the increase in the number of horses to each male worker from 1.7 to 2.3, a gain of about 35 per cent; the other is the increase in the number of acres cultivated to each male worker from 23.3 to 31.0, or about 34 per cent. From these figures it appears that in the last twenty years, by the aid of machinery, and the substitution of horse power for hand labor, the effectiveness of human labor on farms has been increased to the extent of about 33 per cent."

The statement that there has been an 'increase in the number of horses and of acres cultivated, to each male worker' is mathematically correct enough but it gives the impression that the *farmers have both increased in numbers at the same rate as people engaged in other occupations and have expanded their holdings*, which is not at all true. It will be noted that the num-

ber of horses per acre of cultivated land was the same in 1900 as in 1880. Horses and crop acreage have, therefore, increased at an equal rate. Either these have increased at an extraordinary rate or the third term (male workers), has increased at less than the normal rate. It will be shown farther on (pp. 36–38) that this latter hypothesis is the true one. The increased crop acreage per worker is, therefore, to be looked upon not so much as an expansion of farm holdings as a contraction in the number of workers.

The average number of acres[1] in all farm crops per farm worker[2] (agricultural laborers, farmers, planters, and overseers)—male and female—as returned by the Censuses of 1880, 1890, and 1900 was as follows:

	1900.	*1890.*	*1880.*
United States[3]	27.0	25.9	21.8
North Atlantic division	21.3	21.2	21.7
South Atlantic division	13.3	14.2	13.8
North Central division	45.2	40.4	31.9
South Central division	16.5	15.9	14.2
Western division	39.6	33.7	34.2

Presented from the basis of a common denominator, the data shown in the foregoing table appear as follows:

	Base.	*1880.*	*1890.*	*1900.*
United States	21.8 =	100	118.7	123.8
North Atlantic division	21.7 =	100	97.7	98.0
South Atlantic division	13.8 =	100	102.9	98.6
North Central division	31.9 =	100	126.6	141.7
South Central division	14.2 =	100	111.9	116.7
Western division	34.2 =	100	98.5	115.8

Such calculations are good as indicating the greater crop area which the average person finds it profitable to

[1] For data of acreage see p. 102.

[2] For total number of workers see p. 99.

[3] In the various tables presented in this essay the term "United States" is used to signify only the five principal geographical divisions taken collectively. Data from the Census Reports have been modified, when necessary, to make them conform to such restricted meaning.

tend when aided by machine power. One needs to be on guard, however, against taking them as indexes of the greater effectiveness of man-labor, due to the use of machinery; for obviously, they take no account of the character of the cultivation—whether intensive or extensive. Construed as indexes of effectiveness, these figures show that the effectiveness of the average worker in the North Central, South Central, and Western Divisions has been much increased during the period from 1880 to 1900 while that of the average worker in the North Atlantic and South Atlantic divisions has actually become less. Such a conclusion would be clearly wrong. There is good reason for believing that the effectiveness of the average farm worker in each of these divisions,[1] and even in the New England States alone[2] was, in all likelihood, very much greater in 1900 than in 1880.

If we take the value of product per person engaged in agriculture as an index of effectiveness under the methods in use in 1880 and in 1900 we shall find that the effectiveness of the average worker in the United States was greater, by nearly 60 per cent.,[3] in 1900 than in 1880.

The census of 1870 did not report crop acreage at all, and the value of agricultural products was reported in connection with the value of betterments, so that no showing of the relative effectiveness of agricultural workers, in 1870 and in 1900, based either on crop acreage or on value of products, can be made; but, judged by the quantity of cereal product reported, per

[1] See p. 69-70.

[2] See p. 31.

[3] 58.4 per cent. For value of product per person engaged in agriculture in 1880 and 1900 see table at p. 70.

person engaged in farm work (*i. e.*, farmers, planters, overseers, and agricultural laborers), the effectiveness of the average farm worker in 1900 was greater than in 1870 by nearly 86 per cent.[1] The data at hand do not appear to admit of any similar showing as between the year 1900 and any date prior to 1870.

THE GREATER EFFECTIVENESS OF FARM WORKERS WHEN AIDED BY THE USE OF MACHINERY, AS SHOWN BY INVESTIGATIONS OF THE DEPARTMENT OF LABOR

The Thirteenth Annual Report of the Department of Labor gives the results of an extended investigation concerning production by hand and by machine methods, and affords the means for a reliable estimate of the influence of machine power. That portion devoted to agricultural operations shows in detail, for example, how many persons were ordinarily required for the production, by hand or by machine methods, of a given quantity of barley; what separate operations were necessary in that production, as plowing, sowing, harrowing, etc.; what time was required for each operation, what tools or machines, if any, or other helps were used, and the money cost of each operation.

From the summary given on pages 24–25 of that report it appears that the man-labor power requisite for the production of thirty bushels of barley by the methods commonly in use in the season of 1829–30, amounted to 63 hours and 35 minutes. The man-labor power required for accomplishing the same result, by the methods commonly in use in the season of 1895–96, is shown to have been only 2 hours and 42.8 minutes. From such data, the barley crop of 1896 being known,

[1] 85.8 per cent. The cereal product per worker, as above, in 1870, was 236.5 bushels; in 1900 it was 439.6 bushels.

we may readily determine not only what amount of man-labor was requisite for the production of that crop by the means commonly in use at that time, but also how much barley that same labor-power could have produced by the means commonly in use in the season of 1829–30. The difference between the quantity actually produced in the season of 1895–96, and the quantity which the labor-power required for the work of that season, could have produced by the earlier hand methods, will represent the greater product due to the use of machinery. The crediting of the whole of this difference to the use of machinery is, doubtless, crediting it with too much. Credit is due, also, to better methods of cultivation, to pulverization of soils, to the use of fertilizers, to irrigation, rotation of crops, better seed, etc. These are not machine forces although they are largely dependent upon the use of machinery as the use of machinery is, in some degree, dependent upon them. But to attempt the separation of these credits would be much like attempting to determine which blade of a pair of shears does the cutting. Moreover, these various other forces play, comparatively, a very incidental and subsidiary part. I believe that the following pages will justify this opinion and venture, therefore, to disregard whatever inaccuracy there may be involved in the statement and to say that the entire increased product is due to the use of machinery.[1]

It will be sufficient, for purposes of illustration, to consider only a few of the principal crops in the pro-

[1] For the purpose of this discussion I shall use the term machinery, generally, to signify not only machines, but also tools or implements, and other man-labor saving forces when used as essential adjuncts or parts of machines. For example, horses, when used to draw a reaping machine, will be considered as much a part of the machine as an engine and boiler would be, if used for the same purpose.

duction of which machinery has become a recognized factor. The crops selected for this purpose, together with the time of man-labor requisite for produciug stated quantities of each crop by hand and by machine methods, as reported by the Department of Labor, are shown in the following table :—

Unit No. 1	Name and quantity of crop produced and description of work done.	Year of Production		Time Worked			
				Hand		Machine	
		Hand	Machine	hrs.	min.	hrs.	min.
3	Barley : 30 bushels (1 acre) barley	1829-30	1895-96	63	35.0	2	42.8
9	Corn : 40 bushels (1 acre) yellow corn, husked ; stalks left in field	1855	1894	38	45.0	15	7.8
10	Cotton : By hand, 750 pounds ; by machine 1000 pounds(1 acre) seed cotton.	1841	1895	167	48.0	78	42.0
12	Hay : Harvesting 1 ton (1 acre) timothy hay	1850	1895	21	5.0	3	56.5
13	Oats : 40 bushels (1 acre) oats	1830	1893	66	15.0	7	5.8
16	Potatoes : 220 bushels (1 acre) potatoes . .	1866	1895	108	55.0	38	. .
17	Rice : 2640 pounds (1 acre) rough rice . .	1870	1895	62	5.0	17	2.5
18	Rye : 25 bushels (1 acre) rye	1847-48	1894-95	62	58.9	25	10.0
26	Wheat : 20 bushels (1 acre) wheat	1829-30	1895-96	61	5.0	3	19.2

These several crops for the years covered by the data concerning production by the aid of machine power, were as follows :[2]

[1] The "unit numbers" here given are the unit numbers made use of in the Thirteenth Annual Report of the Department of Labor, from which the data in the table are taken. The numbers are repeated here only for purposes of reference.

[2] Department of Agriculture, Year Book for 1900.

Barley,	crop of	1896	(bushels)		69,695,223
Corn,	" "	1894	(bushels)		1,212,770,052
Cotton,	" "	1895	(500 lb. bales)		7,161,094
Hay,	" "	1895	(tons)		47,078,541
Oats,	" "	1893	(bushels)		638,854,850
Potatoes,	" "	1895	(bushels)		297,237,370
Rice,	" "	1896	(pounds)		168,685,440
Rye,	" "	1895	(bushels)		27,210,070
Wheat	" "	1896	(bushels)		427,684,346

The number of days-work of man-labor requisite for producing the foregoing specified crops by the aid of machine power, together with the quantity of those several crops which the same labor-power could have produced by the earlier hand method, are shown in the following:

Name	Crop of	Days-work of man-labor required	The same labor power		
			by methods of	could have produced	
Barley	1896	630,354	1829-30	(bushels)	2,972,839
Corn	1894	45,873,027	1855	(bushels)	473,528,022
Cotton	1895	28,178,904	1841	(bales)	2,518,972
Hay	1895	18,556,791	1850	(tons)	8,801,640
Oats	1893	11,334,266	1830	(bushels)	68,433,307
Potatoes	1895	5,134,100	1866	(bushels)	103,703,321
Rice	1895	108,889	1870	(pounds)	46,303,587
Rye	1895	2,739,147	1847–48	(bushels)	10,872,795
Wheat	1896	7,099,560	1829–30	(bushels)	23,245,490

Finding next the difference between the quantities of the several crops actually produced under machine methods, in the years indicated, and the quantities which the labor-power requisite for their production with the aid of machines could have produced had it been devoted to the production of those same crops by hand methods, we have the following:

	Crop of	*Due to use of machinery.*		*% of actual product.*
Barley	1896	(bushels) 66,722,384	=	95.7
Corn	1894	(bushels) 739,242,030	=	60.9
Cotton	1895	(bales) 4,642,122	=	64.8
Hay	1895	(tons) 38,276,901	=	81.3
Oats	1893	(bushels) 570,421,543	=	89 2
Potatoes	1895	(bushels) 193,534,049	=	65.1
Rice	1895	(pounds) 122,381,853	=	72.5
Rye	1895	(bushels) 16,337,275	=	60.0
Wheat	1896	(bushels) 404,438,856	=	94.5

The increased effectiveness of man labor power when aided by the use of machinery, as indicated by these figures, varies from 150 per cent in the case of rye to 2244 per cent in the case of barley. From this point of view a machine is "not a labor-saving" but rather a "product-making" device.[1] Taking the per cent of labor saved (See page 29), as indicating the average proportion of these crops due to the use of machinery, it appears that the quantity of product is almost five times as great, per unit of labor, as it formerly was.

THE COST OF PRODUCTION

Touching the difference in the cost of production per unit of product the Thirteenth Annual Report of the Department of Labor furnishes some data that will well repay a somewhat extended consideration. It should be observed, however, that these data with reference to the cost of production, although collected at the same time and, doubtless, with the same care, as the data already taken from that report, are, nevertheless, for the purposes of generalization, far less reliable. The average workman will perform the same quantity of work in a day, whether he works in one locality or in another; but rates of wages vary with localities and may vary both absolutely and relatively with differences in time. With this qualification in mind, it will be safe to take up the consideration of the data.

[1] Hadley; Economics, page 338.

Including the crops above considered, the report of the Department of Labor, gives detailed information concerning the cost of production, by hand and by machine methods, of twenty-one different crops. The table on the next page gives the results of the several investigations in this particular, arranged in the order of the greatest saving in cost of production by machine as compared with hand methods.[1]

The per cent column of the following table shows that, for the most part, there has been a very great decrease in the cost of producing these various crops. The median is 39.92 per cent, but this number is clearly too low, for the crops in which machinery is most used are principally in the upper part of the table.

[1] In the production of peas and in both tobacco crops there has been an increase in the cost. This increase is not, however, from the use of machinery in the production of these crops, but rather from the lack of it. In the case of tobacco (unit 22), for example, in which there has been the greatest increase in cost, the hand method production was with the aid of the following: wagon, spades, hoes, rakes, wooden moldboard plows, harrow, turn plow, wooden pegs for setting plants, plow for cultivating, and tobacco knives. The total extent of the machinery used in the production of this crop by machine methods was as follows: plow, harrow, rakes, hoes, disk harrow, drag, wagon and barrels, transplanter, double-shovel plow, tobacco knives, wagon and racks, and screw racket prize. (Thirteenth Annual Report, Department of Labor, page 464.)—It must be evident at once from a comparison of these items that the difference in machinery cannot account for the difference in cost of production. The cause of the increased cost in the production of tobacco and peas (units 15, 22, and 23) was a higher rate of wages. In the case of peas, wages rose from 62½ cents to $1.00 per day. In the case of tobacco (unit 22), wages rose from 30 cents per day to $20 and $23 per month; in unit 23, the rise of wages was from 75 cents to $1.00 per day. It will be readily understood that when there is little or no change in the methods of production a rise in the rate of wages must cause a rise in the total cost of production.

The "hand method" of production, as explained in the report of the department, "should not be construed to mean a method whereby a product is made entirely by the unaided hand and absolutely without the use of machines, but rather as the primitive method of production which was in vogue before the general use of automatic or power machines"—(Thirteenth Annual Report, Department of Labor, p. 11.)—Similarly, it should be observed, in this connection, that "machine method" does not necessarily imply that machines are used, but only that the work was done by the most approved methods practiced in more recent years.

For a table of wages under hand and machine methods, see p. 60.

Unit No.[1]	Name and Quantity of Crop Produced.	Year of Product'n		Cost.		Per cent Decrease
		Hand Method.	Machine Method.	Hand Method.	Machine Method.	
3	Barley; 30 bu. (1 acre)	1829–30	1895–96	$ 3.88	$ 1.06	72.62
27	Wheat: 20 bu. (1 acre)	1829–30	1895–96	4.00	1.12	71.98
5	Broom corn: 1 ton (3 acres)	1860	1895	90.33	25.37	71.92
17	Rice: 2640 lbs. (1 acre)	1870	1895	7.20	2.08	71.09
21	Sweet Potatoes: 105 bushels (1 acre)	1868	1895	34.30	10.29	70.00
12	Hay: Harvesting 1 ton (1 acre) timothy hay	1850	1895	1.92	.63	66.95
8	Corn: 40 bushels (1 acre) yellow corn, shelled; stalks, husks and blades cut into fodder	1855	1894	16.34	6.62	59.49
20	Sugar corn: 20 tons (1 acre)	1855	1895	40.32	16.37	59.40
13	Oats: 40 bushels (1 acre)	1830	1893	3.85	1.60	58.47
19	Strawberries: 4,000 qts. (1 acre)	1871–72	1894–95	231.28	97.92	57.66
24	Tomatoes: 150 bu. (1 acre)	1870	1895	36.62	15.88	56.64
16	Potatoes: 220 bu. (1 acre)	1866	1895	13.18	5.97	54.68
26	Wheat: 20 bu. (1 acre)	1829–30	1895-96	3.83	2.03	47.11
11	Hay: Harvesting and baling 1 ton (1 acre) timothy hay	1860	1894	3.19	1.91	39.92
2	Apple trees: 10,000 (1 acre) 32 months, from grafts	1870–72	1893–95	200.00	121.00	39.50
4	Beets: 300 bushel (1 acre	1850	1895	32.30	20.01	38.05
9	Corn: 40 bushels (1 acre) yellow corn, husked; stalks left in field	1855	1894	5.03	3.31	34.20
7	Carrots: 30 tons (1 acre)	1850	1895	38.71	37.21	29.72
14	Onions: 250 bu. (1 acre)	1850	1895	32.56	23.89	26.64
1	Apple trees: 10,000 (1 acre) 32 months, from grafts	1869–71	1893–95	202.00	150.69	25.41
10	Cotton[2]: By hand 750 lbs.; by machine 1000 lbs. (1 acre)	1841	1895	6.15	4.71	23.42
18	Rye: 25 bushels (1 acre)	1847–48	1894–95	5.25	4.30	18.10
25	Turnips: 350 bu. (1 acre)	1855	1895	25.63	23.36	8.88
6	Carrots: 30 tons (1 acre)	1855	1895	30.61	29.96	2.13
						Per cent. Increase
15	Peas: 20 bushels (1 acre) field Peas	1856	1895	6.66	6.76	1.56
23	Tobacco: 1,500 lbs. (1 acre) Spanish seed leaf	1853	1895	25.85	27.99	8.28
22	Tobacco:[3] By hand, 1,200 lbs.; by machine 1,250 lbs. (1 acre)	1844	1895	.74	2.67	261.42

[1] See footnote "1" page 21.

[2] The data have been modified to show a comparison on the basis of equal quantities produced. If the equal areas be taken instead, the line should read: Cotton: By hand, etc., $9.23; $9.42. 2.09.

[3] The data have been modified to show a comparison on the basis of equal quantities produced. If the equal areas be taken instead, the line should read: Tobacco: By hand, etc., $8.88; $33.39; 276.33.

The data requisite for a similar showing with respect to all farm crops and for any certain period are, I think, not to be had; but we can apply the data presented in the foregoing table to the principal crops of the year 1899, as reported by the Twelfth Census.[1] The results are as follows:—

THE COST OF PRODUCING CERTAIN CROPS OF THE YEAR 1899, BY HAND AND BY MACHINE METHODS.

Name[2]	*Quantity produced*	*Cost of Production*	
		Hand Method	*Machine Meth.*
Barley (3) . . . . . (bu.)	119,634,877	$ 15,472,777	$ 4,227,098
Broomcorn (5) . . . (lbs.)	90,947,370	4,107,576	1,153,650
Corn (9) . . . . . (bu.)	2,666,440,279	335,304,865	220,647,933
Cotton (10) . . . . (bales)	9,534,707	58,638,448	44,898,469
Hay (12) . . . . . (tons)	84,011,299	161,301,694	52,927,118
Oats (13) . . . . . (bu.)	943,389,375	90,801,227	37,735,575
Onions (14) . . . . (bu.)	11,791,121	1,535,675	1,126,759
Peas (15) . . . . . (bu.)	9,440,269	3,143,609	3,190,810
Potatoes (16) . . . . (bu.)	273,328,207	16,373,935	7,417,133
Rice (17) . . . . . (lbs.)	283,722,627	773,788	223,539
Rye (18) . . . . . (bu.)	25,568,625	5,369,411	4,397,803
Sugar cane (20) . . (tons)	6,441,578	12,986,221	5,272,431
Sweet potatoes (21) (bu.)	42,526,696	41,676,162	4,167,616
Tobacco (22) . . . . (lbs.)	868,163,275	6,424,408	18,491,859
Wheat (26) . . . . . (bu.)	658,534,252	126,109,309	66,841,226
Total		$880,019,105	$472,719,019

The estimated cost of producing these crops by machine method is only 53.7 per cent of the estimated cost of producing the same crops by hand method. In other words, the saving in cost of production amounts to 46.3 per cent. The average date of the hand method investigations made use of in this presentation is 1850; the average date for the machine method investigations

[1] Twelfth Census: Agriculture I, p. cxxi.

[2] The figures in parentheses are the unit numbers used by the Department of Labor and indicate what set of reports was used as the basis of the estimated cost of production as here presented. The dates of the investigations for hand and for machine methods may be found by reference to the preceding table.

is 1895—a difference of forty-five years. Surely it will not be too much to say that during the last half of the nineteenth century the cost of production of these crops was reduced by one-half. If we take into account the decreased cost to the farmer of food and lodging for his hired workmen and of the decreased cost of storage room for grain in the straw, then the total saving must appear to be even greater than this.[1]

FLUCTUATIONS IN QUANTITY OF PRODUCT

The use of machinery in the production of agricultural products, as in the production of manufactures, tends to diminish the fluctuations in supply. Capital in any form, cannot, ordinarily, be diverted from the production for which it was designed, without more or less waste. If, for example, a farmer wishes to change from producing wheat to producing potatoes, he must sell his reaper at a sacrifice. The difficulty in making such changes operates against great and sudden changes from

[1] "To ascertain the amount of saving precisely is difficult; but looking through the successive stages of management and seeing that the owner of a stock farm in the preparation of his land by using lighter ploughs is able to cast off one horse in three; and by adopting other simple tools to dispense altogether with the great part of his ploughing; that in the culture of crops by the various drills, horsepower can be partly reduced; the seed otherwise wanted, partly saved; and the use of manures greatly economized; while the horse hoe replaces the hoe at one half the expense; that at harvest the American reaper can effect nearly thirty men's work; while the Scotch cart replaces the old English wagon with exactly half the horses; that in preparing corn for food the steam threshing machine saves two thirds of our former expense; and in preparing food for stock the turnip-cutter, at an outlay of 1s., adds 8s. a head in one winter to the value of sheep; lastly, that in the indispensable but costly operation of drainage, the materials have been reduced from 80 s. to 15 s., to one fifth namely of their former cost; it seems to be proved that the efforts of agricultural mechanists have been so far successful, as in all these main branches of farming labour taken together, to effect a saving on outgoings or else an increase of incomings of not less than one-half."—Quoted from Pusey's report on Agricultural Implements in the Exhibit of 1851, by Hearn, "Plutology," page 171.

one line of production to another, even when the prospects for profit in such other line may be unusually bright. Thus the supply of the more profitable product is restricted. On the other hand, farmers having their capital in the form of machinery devoted to the production of some particular crop, will continue to produce somewhat of that crop rather than to have their capital lie idle or to suffer a greater loss from an attempt to change. This influence operates towards maintaining the former supply.

As a consequence of these two dissimilar forces, the supply of any product is more constant, and the resulting fluctuations in price less violent than they otherwise would be.

THE QUALITY OF AGRICULTURAL PRODUCTS

The use of machinery is not without some influence on the quality of the product. Corn, which, by reason of too early or too late planting, as was necessarily frequent under hand methods of production, does not mature properly, and is unwholesome; and grain cut, as formerly, under hand methods, before it is thoroughly ripened, becomes shrunken and of less value.

In the matter of preparing grain for use the advantages of machinery are equally evident. The present generation of Americans would be slow to eat bread made of flour from wheat threshed by the treading of horses or cattle.

PART III

MACHINERY AND LABOR

SAVING OF LABOR

The quantity of labor which, by the use of machine power, is saved for other uses, may be determined, in the case of any particular crop, by finding the difference between the number of days-work requisite for producing it by hand and by machine methods. In the following table there is shown the quantity of man-labor requisite for producing the nine principal farm crops by hand and by machine methods; the quantity of labor saved in each case by the use of machinery; and the per cent which the quantity of saved labor is of the quantity requisite for producing the several crops by hand method.

DAYS-WORK NECESSARY TO PRODUCE

BY HAND METHODS

	Crop of	*Methods of*	*Days-work*
Barley	1896	1829–30	14,771,515
Corn	1894	1855	117,487,098
Cotton	1895	1841	80,108,771
Hay	1895	1850	99,257,257
Oats	1893	1830	105,810,334
Potato	1895	1866	14,715,501
Rice	1896	1870	396,687
Rye	1895	1847–48	6,854,942
Wheat	1896	1829–30	130,621,927
Total			570,024,032

BY MACHINE METHODS

	Crop of	*Methods of*	*Days-work*	*Days-work saved by machinery*	*Per cent*
Barley	1896	1895–96	630,354	14,141,161	= 95.7
Corn	1894	1894	45,873,027	71,614,071	= 60.9
Cotton	1895	1895	28,178,904	51,929,867	= 64.8
Hay	1895	1895	18,556,791	80,700,466	= 81.3
Oats	1893	1893	11,334,266	94,476,068	= 89.2
Potato	1895	1895	5,134,100	9,581,401	= 65.1
Rice	1896	1896	108,889	287,796	= 72.5
Rye	1895	1894–95	2,739,147	4,115,795	= 60.0
Wheat	1896	1895–96	7,099,560	123,522,367	= 94.5
Totals			119,655,038	450,368,992	= 79.0

The total amount of man-labor-power saved by the use of machinery in the production of these nine crops was 450,368,992 days-work or 79.0 per cent of the amount of work which would have been required to produce those same crops by the earlier hand methods. In other words, the quantity of labor now requisite for the production of a given quantity of these nine crops is, on the average, only 21 per cent, or a little over one-fifth of the quantity which would be requisite under the former hand methods of production.[1]

DISPLACEMENT OF LABOR

The question of the displacement of labor is one of peculiar interest to those who work for hire, because upon it seems to depend the further question of whether the use of machinery decreases the opportunities for earning a livelihood. That the introduction of machinery does frequently deprive workmen of employment in particular lines of work is undeniably true. The introduction of a harvesting machine throws cradlers and binders out of employment just as certainly as the introduction of water drives air out of a jug. It is idle to say that machinery does not displace individual workmen and equally idle to contend that such displacement does not entail hardship and suffering, for the more thoroughly and completely one devotes himself to any particular line of work, the less fitted does he become for taking up, and gaining a livelihood in, some other occupation. The extent of change which the introduction of machinery produces in the occupation of individuals is much obscured by the fact that the machine workman is usually given

[1] See also Edward Atkinson's "Distribution of Products", pages 14–15 and 287.

the same name as was borne by his predecessor; as, for example, men who operate a steam threshing machine are called threshers, though they may never have seen a flail and are almost as little fitted for operating a flail and winnowing apparatus as the old time threshers would be to operate the new machine. The *old* occupation is gone. What we now have is a *new* occupation passing under the old name. And a new class of workmen (machinists,) are in charge.

It is only when we speak of labor as a quantity or of laborers in mass that we can presume to say there has been no displacement of labor by machinery; and yet there may be, in this sense also, a displacement of labor. The displacement may be absolute, as where the labor force in any line of work is decreased, or it may be only relative, as where the rate of increase in the number of laborers employed falls below the rate of increase of laborers employed in industries generally.

THE ABSOLUTE DISPLACEMENT

For the agricultural industry considered as a whole, New England furnishes an instance of the absolute displacement of labor. In 1880, the population, ten years of age and over, engaged in agriculture, numbered 304,679; but in 1900, the number was only 287,829.[1] This decrease was not due to a decadence of agriculture in those states, for the value of the New England agricultural products was more than fifty per cent greater in 1900 than in 1880.[2] It must have been due to the introduction of machinery as indicated

[1] See page 101.

[2] The value of New England agricultural product, as reported in 1880, was $103,343,566; in 1900 it was $169,523,435. Twelfth Census: Agriculture I, page 703.

by the reported valuation of agricultural implements and machines, which increased from $1.68 per acre of improved land in 1880, to $4.49 per acre in 1900.[1]

With respect to the work of cultivating and caring for those nine crops in the production of which machinery appears to be most extensively used, we may determine what absolute displacement, if any, has taken place by finding in each case what amount of labor was necessarily employed in the time of production by hand methods and comparing that amount with the amount of labor necessarily employed in the time of production by machine methods. Data of crop production for the exact years covered by the report of the Department of Labor concerning production by hand method cannot be secured for all of the crops, but taking the best available data and tabulating results we have the following:

DAYS-WORK OF MAN-LABOR REQUIRED FOR PRODUCING THE

	Crop of[2]	*By methods of*	*Days-work*
Barley	1839	1829–30	882,007
Corn	1855	1855	74,151,217
Cotton	1841	1841	13,717,188
Hay	1849	1850	29,176,470
Oats	1839	1830	20,381,312
Potato	1866	1866	5,307,260
Rice	1871	1870–71	124,383
Rye	1849	1847–48	3,574,396
Wheat	1839	1829–30	25,905,766
Total			173,219,999

[1] Twelfth Census: Agriculture I, page 698.

[2] The barley crop of 1839 was 4,161,504 bushels—Sixth Census, page 408.

The corn crop of 1855 is assumed to be 765,431,923 bushels. This is midway between the amounts reported to the census office in 1850 and 1860.

The cotton crop of 1841 was 1,634,945 bales.—World Almanac for 1896, page 164.

The hay crop of 1849 was 13,838,642 tons.—Eleventh Census: Agriculture, page 90.

	Crop of	*By methods of*	*Days-work*	*Difference in days-work*	*Displacement per cent*
Barley	1896	1895–96	630,354	251,653	28.5
Corn	1894	1894	45,873,027	28,278,190	38.1
Cotton	1895	1895	28,178,904		
Hay	1895	1895	18,556,791	10,619,679	36.4
Oats	1893	1893	11,334,266	9,047,046	44.4
Potato	1895	1895	5,134,100	76,536	3.3
Rice	1896	1895–96	108,889	15,494	12.5
Rye	1895	1894–95	2,739,147	835,249	23.4
Wheat	1896	1895–96	7,099,560	18,806,206	72.6
Total			119,655,038	67,930,053	42.5

The table shows that in the work of producing each of the crops considered, excepting only the cotton crop, there has been an absolute displacement of man labor. Disregarding the cotton crop, the absolute displacement in the work of producing the other eight crops is 42.5 per cent. If cotton be included in the summary and allowance be made for the additional labor employed in the production of that crop, the absolute displacement becomes 30.9 per cent.

The oats crop of 1839 was 123,054,992.—Report of the Department of Agriculture for 1862, page 572.

The potato crop of 1866 was 107,200,976 bushels.—Year Book of Department of Agriculture, 1898, page 679.

The rice crop of 1870–71 was 52,892,400 pounds.—Letter of August 26, 1902 from Department of Agriculture, Division of Statistics.

The rye crop of 1849 was 14,188,813 bushels.—Patent Office Report, 1853, Part 2, page 155.

The wheat crop of 1839 was 84,821,065 bushels.—Report of Department of Agriculture, 1862, page 572.

Crop reports for the desired years could not be found in every case. When the difference between the year reported upon by the investigations of the Department of Labor and the nearest year for which a crop report could be had was greater than one year a later crop report was preferred as yielding a displacement of labor too low rather than too high.

THE RELATIVE DISPLACEMENT

The relative increase or decrease of the population engaged in agriculture as compared with the increase or decrease of the population engaged in each of the other occupation classes, for the continental portion of the United States, and for the several geographical divisions, during the period from 1880 to 1900, is shown in the followiug tables:[1]

UNITED STATES

Males and females ten years of age and over	*Base*	*1880*	*1890*	*1900*
Total population	36,761,607=100		129.0	157.6
In gainful occupations	17,392,099=100		130.7	167.2
In agriculture	7,713,875=100		111.0	135.9
In professional services	603,202=100		156.6	208.7
In dom. and per. services	3,423,815=100		123.3	163.0
In trade and transp.	1,866,481=100		178.2	255.4
In manfg. and mech. arts	3,784,726=100		150.0	187.2

NORTH ATLANTIC DIVISION

Total population	11,270,090=100		123.2	148.1
In gainful occupations	5,309,722=100		131.3	161.6
In agriculture	1,048,442=100		104.9	102.5
In professional services	207,551=100		144.3	198.2
In dom. and per. services	1,211,958=100		121.1	153.2
In trade and transp.	828,802=100		158.9	225.4
In manfg. and mech. arts	2,012,969=100		138.1	167.4

SOUTH ATLANTIC DIVISION

Total population	5,286,645=100		121.4	144.1
In gainful occupations	2,677,762=100		116.4	149.4
In agriculture	1,622,081=100		102.9	125.3
In professional services	62,309=100		148.2	191.6
In dom. and per. services	517,429=100		112.3	154.4
In trade and transp.	177,436=100		174.0	238.0
In manfg. and mech. arts	298,507=100		156.4	210.3

NORTH CENTRAL DIVISION

Total population	12,760,841=100		132.5	158.9
In gainful occupations	5,625,123=100		136.4	170.3
In agriculture	2,735,525=100		113.9	128.3
In professional services	230,622=100		161.0	207.4
In dom. and per. services	1,025,089=100		129.6	171.7
In trade and transp.	595,791=100		193.2	280.5
In manfg. and mech. arts	1,038,096=100		164.3	208.4

[1] For absolute numbers, see page 93.

SOUTH CENTRAL DIVISION

Males and females ten years of age and over	*Base 1880*	*1890*	*1900*
Total population	6,076,243=100	128.4	166.6
In gainful occupations	3,022,173=100	120.3	172.4
In agriculture	2,120,525=100	109.5	155.7
In professional services	73,455=100	155.6	207.4
In dom. and per. services	464,909=100	112.7	170.7
In trade and transp.	161,449=100	195.3	294.8
In manfg. and mech. arts	201,835=100	178.5	241.3

WESTERN DIVISION

Total population	1,367,788=100	175.5	236.5
In gainful occupations	757,319=100	176.5	224.9
In agriculture	187,302=100	191.5	248.3
In professional services	29,265=100	228.6	333.1
In dom. and per. services	204,430=100	156.1	181.6
In trade and transp.	103,003=100	227.3	320.3
In manfg. and mech. arts	233,319=100	153.3	188.4

In the United States as a whole, and in each division, excepting only the Western division, the rate of increase in the agricultural population has been much lower than in any other one of the occupation classes. Not only this, but, subject to the same exception, it has been lower than either the rate of increase in the total population or in the number of those engaged in gainful occupations. We must conclude, therefore, that for the period from 1880 to 1900, as compared with the growth in the number of those engaged in other industries, there has been a decrease in the number of those engaged in agriculture.[1]

[1] Bringing together the data concerning the population engaged in agriculture, as presented in the foregoing tables, so as to show the relative rate of increase in that class in the different sections of the country, we have the following :

POPULATION ENGAGED IN AGRICULTURE—(MALES AND FEMALES)

	Base 1880	*1890*	*1900*
United States	7,713,875=100	111.04	135.88
North Atlantic division	1,048,442=100	104.86	102.47
South Atlantic division	1,622,081=100	102.89	125.30
North Central division	2,735,525=100	113.94	128.26
South Central division	2,120,525=100	109.48	155.66
Western division	187,302=100	191.51	248.34

The rate of increase of males and females in the various occupation classes has been very different. The relative rates of increase, in the agricultural industry, as reported for the several sections of the country, are shown in the following table:

POPULATION ENGAGED IN AGRICULTURE[1]

	Base	*1880*	*1890*	*1900*
United States, males	7,119,365=100		110.78	132.09
females	594,510=100		114.19	164.39
North Atlantic div., males	1,043,497=100		103.38	99.64
females	4,945=100		418.07	701.37
South Atlantic div., males	1,358,072=100		104.68	125.00
females	264,009=100		93.67	126.86
North Central div., males	2,720,123=100		111.64	125.31
females	15,402=100		520.47	649.38
South Central div., males	1,811,486=100		110.28	155.03
females	309,039=100		104.80	159.30
Western div., males	186,187=100		188.98	241.57
females	1,115=100		613.36	1379.55

The foregoing table shows that women, much more rapidly than men, are turning to agricultural pursuits. The introduction and use of machine power, by decreasing the requirements of physical strength has placed men and women upon a more equal footing and women promise now to invade the agricultural industry as they have heretofore invaded that of manufactures.

We may ascertain the extent of the movement to or from any occupation class during any period by comparing the distribution of the people among the various occupation classes at the beginning of such period with their distribution at its close.

The following table shows, for the United States and for the several geographical divisions, what per cent of the total number of those engaged in gainful occupations in 1870 and in 1900 were in the several occupation classes.[2]

[1] See pp. 94–95.

[2] See p. 96.

		Agriculture	*Prof. service*	*Dom. & Pers. service*	*Trade and Transp.*	*Mfg. & Mech. Arts*
United States	1900	35.7	4.3	19.2	16.4	24.4
	1870	47.6	3.0	18.2	9.8	21.4
North Atlantic div.	1900	12.5	4.8	21.6	21.8	39.3
	1870	24.9	3.4	21.4	14.2	36.1
South Atlantic div.	1900	50.8	3.0	20.0	10.5	15.7
	1870	63.8	2.0	17.5	5.9	10.8
North Central div.	1900	36.6	5.0	18.4	17.4	22.6
	1870	52.5	3.4	16.7	9.3	18.1
South Central div.	1900	63.4	2.9	15.2	9.1	9.4
	1870	71.5	2.2	14.0	5.3	7.0
Western div.	1900	27.3	5.7	21.8	19.4	25.8
	1870	27.2	3.1	25.4	12.4	31.9

Finding the difference between these several pairs of per cents, and representing increases by positive numbers and decreases by negative numbers, we get the per cent of those engaged in gainful occupations who have shifted to or from the several occupation classes, during the period from 1870 to 1900, as follows:

	Agriculture	*Prof. services*	*Dom. & personal services*	*Trade and Transp.*	*Mfg. & mech. arts*
United States	—11.9[1]	1.3	1.0	6.6	3.0
North Atlantic div.	—12.4	1.4	0.2	7.6	3.2
South Atlantic div.	—13.0	1.0	2.5	4.6	4.9
North Central div.	—15.9	1.6	1.7	8.1	4.5
South Central div.	— 8.1	0.7	1.2	3.8	2.4
Western div.	0.1	2.6	—3.6	7.0	—6.1

[1] This —11.9 per cent does not mean that there was a decrease, *absolutely*, in the number of those engaged in agriculture, but only *relatively*, and in this sense; that, whereas the number of those engaged in agriculture increased during the period from 1870 to 1900, the increase was so much less than in the other occupation classes that this particular class failed, by a number equal to 11.9 per cent of the total number engaged in gainful occupations in 1900, to maintain its former proportion. A similar remark applies to each one of the other cases where a negative number appears. The decrease in the class of those engaged in manufactures and Mechanic arts, in the Western division is due to the fact that, under the classification used, miners and quarrymen are included in that occupation class. In 1870, these workers constituted a high proportion of the total number engaged in gainful occupations in that division.

Now the total number engaged in gainful occupations in 1900 was 29,074,117,[1] and 11.9 per cent. of 29,074,117 gives 3,459,819 as the number which, under the conditions existing in 1870, should have been found in the agricultural class in 1900 in addition to the number actually found in that occupation class. The number reported as engaged in the agricultural industry, in 1900, was 10,381,765.[2] It appears, therefore, that during the period from 1870 to 1900 the agricultural class lost, relatively, almost one-fourth of its membership. Of this number 1,523,365,[3] nearly one-half of the total for the whole United States, were from the North Central States.

A table constructed similarly to the one given above and showing, separately, the shifting of males and of females among the different occupation classes, during the period from 1870 to 1900, is presented herewith as follows:—[4]

SHIFTING OF THE POPULATION ENGAGED IN THE DIFFERENT OCCUPATION CLASSES: 1870–1900.

	Agriculture	*Prof. services*	*Dom. & Personal services*	*Trade and Transp.*	*Mfg. & Mech. Arts*
United States, males	—12.5	0.9	2.5	6.6	2.5
females	— 3.2	3.1	—13.6	8.3	5.4
North Atlantic div., males	—14.4	1.2	2.3	7.5	3.4
females	1.5	1.2	—15.5	10.9	1.9
South Atlantic div., males	—13.8	0.6	3.6	5.3	4.3
females	— 7.8	2.6	— 4.8	2.9	7.1
North Central div., males	—15.7	1.0	2.9	8.0	3.8
females	5.4	2.6	—30.1	12.3	9.8
South Central div., males	— 9.0	0.2	2.5	4.2	2.1
females	— 3.4	2.9	— 5.7	2.4	3.8
Western div., males	1.4	1.7	— 4.1	7.2	—6.2
females	5.0	6.7	—26.0	12.1	2.2

[1] See p. 42. [2] See p. 93.

[3] The number engaged in gainful occupations in the North Central States in 1900, was 9,580,913. (Twelfth Census, Population II, page cxxviii). The portion of this population which, during the period from 1870 to 1900, has shifted from agriculture to other occupation classes was 15.9 per cent. (See page 37.)

[4] See pp. 97–98.

It has been shown above that, relatively speaking, nearly three and a half million people changed from agriculture to other industries during the thirty year period, 1870 to 1900. So great a displacement will, doubtless, at first seem incredible. There is need to look at the problem from another point of view: The total number of persons (*i.e.*, farmers, planters, overseers, and agricultural laborers) reported in 1870 as engaged in farming operations was 5,948,561.[1] They produced in that census year 1,388,526,403 bushels of cereals.[2] Making allowance for the short corn crop of 1869,[3] we may say that they were able to have produced 1,519,704,342 bushels of cereals—an average of 255.4 bushels per worker. At this same rate, the 10,381,765 persons (*i. e.*, farmers, planters, overseers and agricultural workers) engaged in cereal production in the census year of 1900[4] could have produced 2,651,502,781 bushels of cereals. The amount would, however, have been less than the actual product in 1899[5] by 1,783,195,965 bushels. To have made good this deficiency, on the basis of the efficiency of the average worker in 1869, would have required an additional force of 6,981,973 workers. This is more than double the number of those who went from agriculture into other occupations. We must, therefore, in all fairness, say, since the machine power introduced into the business of farm work during the period from 1869 to 1899 has more than taken the place of those workers who, during that period, removed from agriculture to other occupations, it has been the cause of their removal. That more have not so removed is, of course, due to the

[1] See p. 93.
[2] See p. 13.
[3] See p. 15.
[4] See p. 93.
[5] See p. 13.

fact that the farm work of the present day calls for a great amount of work not demanded by the business of farming as followed in earlier years.

The matter of change in the character of farm work has made it very difficult for any one, from ordinary observation alone, to judge rightly of the effect of machine power on labor. Even so eminent an authority on agricultural conditions as Professor Davenport, of the University of Illinois, has been misled into thinking that the labor power supplanted by machinery is offset by the demand for labor in new lines of farm work. In his testimony before the Industrial Commission he stated: "The introduction of machinery has vastly extended agricultural operations. It has extended the acreage under cultivation, and has increased the amount of labor bestowed upon the land per acre. I do not think it has decreased the number of men or the total employment of man power on the lands of the country."[1]

It is barely possible that Professor Davenport and the members of the Industrial Commission who examined him, had reference to the absolute and not to the relative number of workers. If such was the case then all that can be said is that Professor Davenport and the commissioners were rather solemnly deliberating upon a subject concerning which the successive census reports left no room for doubt.

But, one may ask, What becomes of the workers who are thus thrown out of employment? and, Are there not some compensating advantages? The first of these questions is easily answered for in the extreme case of an individual who suffers absolute displacement the only alternative from idleness is to accept a lower

[1] Report of the Industrial Commission, Vol. X, page 256. See also the testimony of Mr. Ketchum on page 132 of that report.

rate of wages for work in his accustomed employment or to enter as an inexperienced workman, in some other employment at, most likely, a still lower rate of wages. His compensating advantage is an uncertain one and one hard to estimate. Besides, it does not ordinarily accrue until the time of his greatest need is passed.[1] It arises from the decreased market price of the commodity which he formerly helped to produce. If it is a commodity which enters into his own consumption then the lower price which he pays for it, will in a measure, off-set the lower wage which he receives in his new occupation. If it is not a commodity which enters into his own consumption then his compensating advantage must come through the stimulus which the decreased price of this particular commodity gives to other industries in which it is employed as "raw material" or, more properly, as a factor of production. Cheaper "raw material" yielding, of course, a decreased cost of production, higher profits, and a stronger demand for labor.[2]

[1] "It is small consolation to a working man to be assured that in a year's time he will have plenty of work, if in the meantime he must remain breadless. Loss of work even for a few weeks may exhaust his credit and the affection and means of his friends, and there may remain nothing for him but starvation, unless poor-laws or private charity come to the rescue."—Nicholson: Effects of Machinery on Wages, p. 30.

[2] "Labor-saving methods seem to be a calamity, because the effect is to interfere with present pursuits and deprive some of their accustomed means of livelihood; to render useless, skill acquired after a lifelong training. The benefits all seem to accrue to the person who first uses an invention, while the ones displaced are apparently shut out of the industrial system. It is not noticed how they are gradually absorbed into other channels of employment that open up as the cost of production is decreased. If such were not the case, the whole industrial mechanism would soon come to a standstill, considering the progress of inventions supplemented by the army of aliens that arrive yearly and the increasing proportion of women breadwinners."—Henry White: "The Problem of Machinery" in *The American Federationist*, Vol. X, page 83.

As to those workmen who suffer only relative displacement there is, ordinarily, no need for any compensating advantages. The greatest hardship which the use of machinery lays upon them is that of avoiding those occupations in which the demand for workmen is becoming weak. It will be noticed too, that for every relative decrease in the number of persons engaged in one industry, there is a corresponding increase in some other industry.[1] As a matter of fact the persons engaged in gainful occupations constitute a greater proportion of the total population now than formerly.[2]

[1] See pp. 37–38.

[2] MALES AND FEMALES TEN YEARS OF AGE AND OVER IN THE UNITED STATES.

Year	*Total number*	*Engaged in gainful occupations.*	*Per cent*
1900	57,949,824	29,074,117	50.2
1890	47,413,559	22,735,661	48.0
1880	36,761,607	17,392,099	47.3
1870	28,228,945	12,505,923	44.3

Ranged on the common basis of 100, for the purpose of comparison, the two columns of absolute numbers in the above table show as follows:

MALES AND FEMALES TEN YEARS OF AGE AND OVER IN THE UNITED STATES.

Year	*Total number*	*Engaged in gainful occupation*
1900	205.2	232.5
1890	168.0	181.8
1880	130.2	139.1
1870	100.0	100.0

These figures show an unmistakable increase in the proportion of those engaged in clearly defined occupations. There are, however, two points which should be borne in mind in any comparative study of the census returns of occupations.

First: the more elementary the industrial organization, the less differentiated are the industrial functions, and hence the proportion of those who can report themselves as having definite occupations is much less than in a highly developed industrial organization in which the workmen are much given to following special lines of work.—(Tenth Census, Population I, page 710.)

Second: The number of different occupations reported upon has

THE AGRICULTURAL WORK OF FORMER TIMES IN THE TOWNS OF TO-DAY

The element of unreality in the transfer from agriculture to other occupations, referred to above (page 39), consists in this, that many of those who, at the present time, are employed in the towns and considered as engaged in occupations other than agriculture, are, in fact, doing work which, in earlier years, was done on the farms; and the persons who then did the work, if classified at all, were classified as agriculturists.

There is no need to cite authority for saying that 150 years ago, not in this country alone but in all countries, much of that which we now call manufactures was considered a part of agriculture. Agricultural implement manufacture, as a distinct industry, was then practically unknown. Each farmer, assisted, perhaps, by the village blacksmith, made his own implements. "Every homestead of any pretension had to be, at the same time, a manufactory of almost all the things required for daily use."[1] "Every housewife spun her own flax and made her own linen."[2] Even within

been repeatedly changed: the number of different occupations reported upon by the several censuses has been as follows:

Twelfth Census	303	Twelfth Census, Occupations, p. xxxii.
Eleventh Census	218	
Tenth Census	265	
Ninth Census	338	
Eighth Census	584	
Seventh Census	323	

Any one will readily recognize that the more minute the classification of occupations the higher must be the proportion of those in gainful occupations as compared with the whole population.

[1] Smith: Colonial Days and Ways, page 110.

[2] McMaster: History of the People of the United States. Vol. I, p. 10.

the past fifty years, the business of ginning cotton has been largely removed from the farm;[1] and, in the report of the Twelfth Census, cotton ginners are classed as manufacturers.[2] The business of cotton ginning like that of grinding corn and wheat, has become specialized and has been removed from the farm. Its classification as a line of manufactures followed, of necessity. The Twelfth Census classifies butter and cheese makers as manufacturers;[3] but in 1870, only the cheese makers were so classified.[4] Butter was made, in 1870, on the farms and as part of farm work. The development of the agricultural implement industry is another instance. The manufacture of the implements and machines from being a feature of farm work,[5] has become a distinct branch of manufactures, employing, according to the returns of the Twelfth Census, during the census year reported upon, an "average number[6]" of 46,582 persons besides 10,046[7] "salaried officials, clerks, etc."

Thus, one after another, functions which formerly were considered as belonging to agriculture have been differentiated from it and removed from the farm,

[1] Twelfth Census, Agriculture I, p .xxx.

[2] Twelfth Census, Population II, p. 507.

[3] Twelfth Census, Population II, p. 506.

[4] Ninth Census, Population, p. 680.

[5] Rogers: Industrial and Commercial History, p. 26.

[6] "The average number of wage-earners (men, women, and children) employed during the entire year was ascertained by using 12, the number of calendar months, as a divisor into the total of the average numbers reported for each month." Twelfth Census: Bulletin No. 69, p. 2.

[7] Twelfth Census, Manufactures IV, page 345. "More than two hundred thousand employees are provided with regular work the year round by the factories that make the implements and machinery, and nearly as many more are engaged in selling, transporting and shipping the products to their final destination."—Geo. E. Walsh; Machinery in Agriculture," in *Cassier's Mag.*, Vol. 19, p. 147.

until the farming business of to-day appears as a remnant of its former self. He is much mistaken, however, who would, from this fact, conclude that the farmer is sinking to the level of a wage-earner. One ought rather to say that it is a sign of the farmer rising to the position of a merchant or manufacturer. It is specializing his work; it is taking away only that which can be more advantageously done in the towns, and leaving to him just that which he can do most advantageously and, therefore, most profitably. It is lifting him to that place in the industrial organism in which his share in the production of economic goods counts most effectively.[1] The underlying and controlling fact is this: that the more highly organized society becomes, the farther it advances along the way from barbarism to a perfect civilization, the more does each individual member of society become dependent upon the offices of every other member.

The transfer of occupations from the country to the town is still going on and will go on until division of labor and labor saving devices shall have ceased to serve their purpose. It is in the nature of things that this should be so, since it can be done more economically; and it is equally in the nature of things that people should compete for the better conditions thus offered. It is in vain to try to keep the boy upon the farm where the work is slipping from his grasp. He must

[1] "Better methods of husbandry, the use of superior implements, specialization of agricultural production and vastly improved transportation facilities, whereby large areas of new lands have been brought under cultivation, have been indispensable to this increase in productive efficiency, in consequence of which a relatively smaller part of the world's population is required to produce the food supply."—C. F. Emerick: Agricultural Discontent," in Pol. Sci. Quar., Vol. XI, p. 436.

follow his work. The zeal which some townspeople manifest in their efforts to persuade the farmers' boys to remain upon the farm betrays a fear that the advent of vigorous blood may diminish the profit which now arises by reason of the somewhat restricted number of competitors.

It must, however, be noted that the introduction of farm machinery is developing work on the farm very much akin to that done in the town, as for example, the cutting and grinding of feed for stock. It minimizes the disagreeable features of farm work,[1] and is giving opportunity for the exercise of a higher order of intellect in farm work.[2] Many advantages, formerly attainable only in towns, are now accessible to the farming classes[3] so that, at the present time, many of the more capable farmers' boys are finding farm life to be the more advantageous avenue to the wealth and social position which they seek.

[1] "The introduction of machinery in many branches of industry—and more especially in agriculture—while increasing, perhaps, the monotony of employment, has also greatly lightened the severity of toil, and in not a few instances has done away with certain forms of labor which were unquestionably brutalizing and degrading, or physically injurious."—David A. Wells: Recent Economic Changes, p. 372.

"There is no more laborious kind of farm work than the spreading of manure; so much so that in farming on a large scale it is difficult to procure labor for the purpose. This can now be dispensed with. A machine called the manure spreader does all this work . . . It does everything in the manuring line except to use foul language."—*Scientific American Supplement*, Vol. 50, p. 20528.

[2] "The farmer has, by his own progressiveness, gained a better standing in business and in social life than he formerly held. The conditions on New England farms are now such as to attract men of brains and intelligence."—Chas. S. Phelps: "Is there a decadence of New England Agriculture," in *New England Magazine*, Vol. 25, p. 383.

[3] See page 71, *et seq.*

THE EFFECT OF THE USE OF MACHINERY UPON THE SIZE OF FARMS AND THE RESULTING RELATIONSHIP BETWEEN THE DEPENDENT AND THE INDEPENDENT FARMING CLASSES

The average size of farms of the Continental United States, and in the several divisions, as shown by the successive census returns from 1850 to the present, given in acres, is as follows:[1]

	1900	*1890*	*1880*	*1870*	*1860*	*1850*
United States	147.0	136.5	133.7	153.3	199.2	202.6
N. Atl. div.	97.5	95.3	97.7	104.3	108.1	112.6
S. Atl. div.	109.1	133.6	157.4	241.1	352.8	376.4
N. Cent. div.	145.2	133.4	121.9	123.7	139.7	143.3
S. Cent. div.	156.0	144.0	150.6	194.4	321.3	291.0
Western div.	393.5	324.1	312.9	336.4	366.9	694.9

An inspection of the foregoing table shows that for the period from 1850 to 1880, for the whole United States and for each division, except the South Central, in 1860, there was a constant tendency toward smaller farms. In the North Atlantic and South Central divisions this tendency is shown to have been still in operation in 1890 and the average size of farms in the North Atlantic division in 1900, although greater than in 1890, was still a trifle below the average shown for 1880. In the South Atlantic division the tendency toward smaller farms has continued unbroken to the present time; but otherwise, for the several divisions and for the United States, as a whole, the year 1880 marks the point of the smallest average sized farms. The returns subsequent to that date, except in the cases noted, show a marked increase in the average size of farms.

The total area in farms may, however, be somewhat misleading, when considered as an index of the extent

[1] Twelfth Census, Agriculture I, page 688.

of farming operations subject to the influence of machinery, as will clearly appear upon a comparison of the data in the table last above given with those of the following table showing the average number of acres of improved land, per farm, 1850–1900, inclusive.[1]

	1900	*1890*	*1880*	*1870*	*1860*	*1850*
United States	72.7	78.3	71.0	71.0	79.8	78.0
N. Atl. div.	57.4	64.3	66.6	68.3	69.0	69.3
S. Atl. div.	47.9	55.6	56.1	80.7	115.6	120.9
N. Cent. div.	101.2	95.8	80.6	69.7	67.7	61.0
S. Cent. div.	48.3	61.0	56.2	60.8	89.7	82.6
Western div.	111.8	157.8	185.9	168.1	106.4	51.8

By this table it appears, that the lowest average number of acres of improved land per farm, for the United States, as a whole, was reached in 1870; that this average was the same in 1880; and that while it rose somewhat in 1890, it fell again in 1900 almost to the level for 1870 and 1880. Turning to the several divisions we find that, with but one exception, the movement toward smaller farms continues and is apparent in the returns for 1900. The one exception is, however, all important in this discussion for it is the North Central division, the one above all others devoted to the use of farm machinery, and in this division it is shown, not only for the period from 1880 but for the whole period from 1850 to 1900, that there has been a strong and unvarying increase in the average number of acres of improved land per farm, rising from an average of 61.0 acres in 1850 to 101.2 acres in 1900.

The average number of acres in crops is a still better index to the extent of farming operations. Unfortunately, this average cannot be given for the whole of the period from 1850 to 1900; but for the more im-

[1] Twelfth Census, Agriculture I, p. xxii.

portant part of that period, namely from 1880 to 1900, it can be given with tolerable completeness. The following table shows the

AVERAGE NUMBER OF ACRES IN ALL FARM CROPS,[1] PER FARM OF TEN ACRES AND OVER IN 1880, 1890, and 1900.[2]

	1900	*1890*	*1880*
United States	49.8	48.6	42.6
North Atlantic div.	35.1	35.7	33.7
South Atlantic div.	29.4	33.4	36.2
North Central div.	73.0	65.1	51.5
South Central div.	33.6	34.3	34.6
Western div.	68.5	68.4	64.5

This last table agrees, in a general, with the corresponding portion of the table showing the average number of acres of improved land per farm; but it is to be noted that, according to the table now presented, the average crop area per farm is less, for the years 1890 and 1900 than for the year 1880, in only two divisions; namely, the South Atlantic and South Central. In each of the other divisions, and for the United States, as a whole, the average crop acreage per farm, both for 1890 and 1900, is greater than in 1880. The movement toward a larger average crop acreage is especially strong in the North Central division.

The relative strength of the tendency toward a greater average crop acreage per farm will be more readily appreciated if the facts disclosed in the foregoing table are presented from the basis of a common denominator, as follows:

[1] For acreage in all farm crops see p. 102.

[2] Number of farms derived from Twelfth Census, Agriculture I, pp. 688 and 690.

INDEX NUMBERS REPRESENTING THE AVERAGE NUMBER OF ACRES IN ALL FARM CROPS, PER FARM OF TEN ACRES AND OVER IN 1880, 1890, AND 1900

	Base	*1880*	*1890*	*1900*
United States	42.6	= 100	114.1	116.9
North Atlantic div.	33.7	= 100	105.9	104.2
South Atlantic div.	36.2	= 100	92.3	80.9
North Central div.	51.5	= 100	126.4	141.8
South Central div.	34.6	= 100	99.1	97.1
Western div.	64.5	= 100	106.0	106.2

There are three principal causes which have operated to produce the different conditions disclosed by this last table.

First: As between the North and South, there is a difference in the character of the workers. The negro workmen, as compared with the white workmen in the North and West, are lacking in the intelligence requisite for conducting extensive farming operations, as also for the using of machine power advantageously. This, coupled with the breaking up of the old plantation system, has tended to give smaller farms in the South Atlantic and South Central divisions.[1]

Second: The character of the principal crops cultivated in the Southern states are those in the cultivation of which, as compared with the crops raised in the Northern states, machine power is but little used. The only machine which plays any considerable part in the production of the distinctively Southern crops, is the cotton gin and the influence of this machine was in full operation long before the year 1880; whereas the influence of the machines used in the production of the distinctively Northern crops was, at that time, only fairly well under way.

Third: As between the North Atlantic, North Cen-

[1] Hammond: Cotton Industry, pp. 123–129.

tral and Western divisions, the character of the cultivation affects the size of farms. The North Atlantic states are much devoted to market gardening and the general character of farm work in that division is, therefore, more intensive and a given area gives employment for a greater quantity of both machine and man-labor power. The Western states, in like manner, much more than the North Central states, are devoted to market garden and orchard products.[1] The North Central states lead in what may be termed field crops.[2]

Looking to the total farm acreage, it may seem questionable whether the effect of machinery is to increase or decrease the size of farms. But it is noticeable that the total farm acreage includes land kept for stock-raising, for timber supply, for speculation, etc., and includes altogether too much of that with which machinery has nothing to do, to make it a fit basis for a study of the influence of farm machinery either upon the size of farms or upon the nature and extent of farm work. When we use the word "farm" to denote only that portion of the land with which machinery has to do (*i. e.*, the area devoted to the production of crops), it becomes apparent that, other things being equal, the use of farm machinery leads to, or is at any rate accompanied by, an increase in the size of farms. This increase is most marked in the states of the North Central division.

SOME CONSEQUENCES RESULTING FROM THE USE OF FARM MACHINERY IN THE REGION MOST DEVOTED TO ITS USE

It has been shown that the cereal and hay crops are those in the production of which machine power

[1] See Twelfth Census, Agriculture II, pp. 324 and 599 *et seq.*

[2] See pp. 52–53.

plays the greatest part. It now becomes needful to know the relative importance of the cereal and hay crops in the different divisions of the country. The following table shows for the United States and for the several geographical divisions, the total number of acres in all crops; the total number of acres in cereals and hay; and the per cent. which the total acreage in the cereals and hay bears to the total crop acreage, as reported by the census of 1900.

	Total crop acreage[1]	*Total acreage in cereals and hay*[2]	*Per cent*
United States	289,734,591	246,674,289	85.1
North Atlantic div.	24,683,365	21,876,493	88.6
South Atlantic div.	29,194,661	19,125,863	65.5
North Central div.	163,000,561	155,000,940	95.1
South Central div.	56,233,143	35,405,091	62.9
Western div.	16,622,861	15,265,902	91.8

For the purpose of further narrowing the field of investigation, it may be assumed also, as a matter of common knowledge, that, although machinery is much used in the production of hay, the work of hay production constitutes relatively but a small portion of the total work requisite for the production of both cereals and hay. It is, therefore, the cereal producing regions to which we must look for the most marked effects of the use of farm machinery.

The following table, taken from the report of the Twelfth Census,[3] indicates the distribution of the cereal crops and the relative importance of the cereal crops, from the standpoint both of acreage devoted to their production and of the value of the product as compared with the acreage and value of all crops.

[1] Twelfth Census, Agriculture II, p. 62.

[2] See p. 102.

[3] Twelfth Census, Agriculture II, p. 62.

	Per cent of acreage of all crops in cereals	*Per cent of value of all crops in cereals*	*Average value per acre of*	
			all crops	*cereals*
United States	63.8	51.0	$10.04	$ 8.02
North Atlantic div.	36.3	26.6	15.19	11.14
South Atlantic div.	58.1	33.6	11.32	6.55
North Central div.	73.2	71.1	8.42	8 18
South Central div.	56.1	36.3	10.99	7 12
Western div.	49.4	37.0	11.59	8.69

The North Central division ranked first in the production of cereals, not only in 1899, but also in 1889 and in 1879.[1] It ranked first also in the production of hay.[2] That it is the region of increasing average size of farms[3] and of increasing crop acreage per person engaged in farm work[4] has already been shown. The North Central states will, therefore, furnish the best field for a study of the effects of farm machinery.

Among the states of the North Central division there were seven which, for the year 1899, reported that over 70 per cent. of their total crop acreage was in cereals and also that the value of their cereal crops for that year constituted more than 70 per cent. of the value of their total crop production.[5] The seven states and the per cent. of their reported cereal acreage and cereal crop values to their total crop acreage and crop values, respectively, are as follows:[6]

[1] Twelfth Census, Agriculture II, p. 63.

[2] Twelfth Census, Agriculture II, p. 215.

[3] See pp. 47–50.

[4] See pp. 16–17.

[5] Oklahoma is the only other State, or Territory, in the Union which reported so high a per cent of acreage and value in cereals for the year 1899. But no separate report was returned for Oklahoma in 1880 and it is, therefore, necessarily omitted from this study.

[6] Twelfth Census, Agriculture II, p. 62.

State	*Cereal Acreage, of total crop acreage. Per cent*	*Cereal Value, of total crop value. Per cent*
Illinois	80.4	77.6
Iowa	76.3	76.9
Kansas	72.5	74.2
Nebraska	79.7	82.3
Minnesota	74.0	75.9
North Dakota	71.7	74 4
South Dakota	70.2	78.3

The hay and forage acreage of these seven states, in 1899, was 35.6 per cent. of the total hay and forage acreage of the United States[1] and their acreage in cereals and hay and forage was 96.6 per cent. of their own total crop acreage.[2] These seven states constitute, therefore, a region in which the cultivated area is almost wholly devoted to the production of those crops in the cultivation and handling of which farm machinery is most used. Their acreage in the different farm crops, as reported to the Census Office, for the period of 1880–1900 was as follows:

	1900	*1890*	*1880*
Cereals[3]	82,116,414	58,522,442	39,923.160
Hay and forage[4]	22,010,381	19,770,323	7,998,365
Tobacco[5]	2,587	4,500	6,906
Hops[6]	911	46	103
Cotton[7]	153	731	
Totals	104,130,446	78,298,042	47,928,534

The average acreage in farm crops, per farm of ten acres and over[8] was, in 1880, 64.4 acres; in 1890, 86.2

[1] Twelfth Census, Agriculture II, p. 215.

[2] The total crop acreage of these seven States in 1899 was 108,394,908 acres—Twelfth Census, Agriculture II, p. 62.

[3] Twelfth Census, Agriculture II, p. 63.

[4] *Idem*, p. 215.

[5] *Idem*, p. 527.

[6] *Idem*, p. 540; Eleventh Census, Agriculture II, p. 91 *et seq.*

[7] Twelfth Census, Agriculture II, p. 424.

[8] Tracts of less than ten acres are excluded as being vegetable, or truck farms, rather than farms for the raising of the crops here considered. For number of farms, see Twelfth Census, Agriculture I, pp. 688 and 690.

acres; in 1900, 102.5 acres. The average acreage in all farm crops, per person cultivating such crops,[1] was, in 1880, 40.6 acres; in 1890, 53.9 acres; in 1900, 62.4 acres.

Presenting these data in form to show the relative rates of increase, we have the following:

	Base	*1880*	*1890*	*1900*
Average acreage in all farm crops per farm	64.4	= 100	133.9	159.2
Average acreage in all farm crops per person cultivating same	40.6	= 100	132.8	153.7

The tendency in machine using states, toward a greater crop acreage per farm and per person, is strong and unmistakable.[2]

The persons who cultivated these crops are classfied as follows:[3]

	1900	*1890*	*1880*
Agricultural laborers[4]	612,418	359,894	352,565
Farmers, planters and overseers	1,056,237	1,091,867	828,800
Totals	1,668,655	1,451,761	1,181,365

Presented from the basis of a common denominator, these data show rates of increase as follows:

[1] Agricultural laborers, farmers, planters and overseers.

[2] "With the coming of the great harvesters, the planters, cultivators, and scores of other farm mechanisms there was an opportunity to double and quadruple the crops and the farms gradually increased from ten and twenty acres to one and two hundred."—Geo. E. Walsh: "Machinery in Agriculture," in Cassiers Mag., Vol. 19, p. 139.

[3] See table of absolute numbers, p. 100.

[4] This includes 4,264 garden and nursery laborers in the returns for 1900 and probably one-half as many of the same in the returns for 1890 and for 1880; but they were not separately reported by the Tenth and Eleventh Censuses, and hence cannot be discarded.

	Base	*1880*	*1890*[1]	*1900*
Agricultural laborers	352,565 =	100	102.1	173.6
Farmers, planters, and overseers	828,800 =	100	131.7	127.4

Disregarding the returns of the Eleventh Census, let us consider what these per cents indicate. Starting in 1880 with a given ratio between the number of farm employees and employers, we find that in twenty years the employed, or dependent class, has increased 73.6 per cent while the employing, or independent class, has increased only 27.4 per cent. In other words, during the twenty year period from 1880 to 1900, the dependent increased 46.2 per cent more rapidly than did the independent class. With these figures in mind, one needs but a moment's reflection to satisfy himself that, at the rates of increase indicated, the dependent class of farm operators must soon outnumber the independent class.[2] There is no need here for ar-

[1] The returns of the Eleventh Census are known to have been very defective in this, that "farmer's sons and daughters were often reported as farmers rather than as farm laborers, thus very much complicating the occupation returns in this class."—(Letter of Carroll D. Wright, under date of Dec. 29, 1899.) That some such error must have crept into the returns is evident on a consideration of the rate of increase of the two classes (*i. e.*, "agricultural laborers" and "farmers, planters, and overseers"), when taken together. The combined rate of increase appears as follows:

	Base	*1880*	*1890*	*1900*
Agricultural laborers, farmers, planters and overseers	1,181,365 =	100	122.9	141.2

These figures show that the total population engaged in farming increased at a uniform rate and there seems no good reason for supposing that there was in fact any such extraordinary movement from the class of employees to the class of employers and then back again within the period of twenty years from 1880 to 1900, as indicated by the returns.

[2] "Of these evils that which is most serious and general is the divorce which machinery is bringing about between labor and capital. So far has this already gone that people have come to think of the two as things naturally distinct from each other, and to regard it as a normal state of affairs that the persons who perform the manual toil of a country shall be absolutety dependent for employment on a com-

gument that a large dependent class is dangerous to society.[1]

The reason for this condition of affairs has been already indicated. The profitable use of a machine requires that it shall have a field of operation suited to its capacity;[2] just as a man, in order that he may work to best advantage, requires more and heavier labor than that suited to a boy. Hence the movement toward larger farms and greater average crop acreage per farm so noticeable in the machine using states. Moreover, the larger farms call for a corresponding increase in the amount of capital at the command of the farmer, especially when, as in this country, there is a tendency toward more intensive cultivation. This is equally true whether the farmer be an owner or a tenant. The

paratively small class known specifically as capitalists, in whose hands are concentrated the implements with which alone modern industry can be successfully carried on. That such dependence is unfavorable to the highest type of manhood will hardly be questioned; and the enormous extent to which machinery has increased and is still increasing the percentage of persons subject to such dependence is surely a most serious matter. The manhood of a nation is its most precious possession, for the loss or deterioration of which no increase of material wealth can adequately compensate."—Edward T. Peters: Some Economic and Social Effects of Machinery, p. 2.

[1] In 1890 the proportion of male agricultural laborers reported as unemployed during some portion of the census year was 17.2 %; in 1900 it was 36.1 %. Females, in 1890, 18.6 %; in 1900, 44.3 %.—Twelfth Census, Occupations, pp. ccxxviii–ccxxxi.

[2] "In order to make the steam power machines of value, the farms must be large and extensive. On small farms, they would prove too costly either in the operation or initial expense. For this reason it has been said that steam power could never supplant horse power on the farms, for our democratic notions demand that farming-lands shall never be consolidated in the hands of a few, and farming on a gigantic scale can never represent more than a very limited part of the industry in this country. Yet the tendency in the West is to operate enormous farms, combining several rather than cutting up into smaller ones."—Geo. E. Walsh: "Steam Power for Agricultural Purposes," in *Harper's Weekly*, Vol. 45, p. 567.

increasing amount of capital requisite for farm proprietorship makes it more and more difficult for a member of the dependent class (*i. e.*, an agricultural laborer), to become a proprietor.[1] His option to work for himself or to work for wages is more and more qualified, and hence the greater proportionate increase in the membership of the dependent class. That there has been a constant increase in the amount of capital requisite for farm proprietorship will be evident from an inspection of the following data, showing for this group of seven states, as reported to the Census Office:

1. The average value, per farm, of all farm property, including land with improvements, implements and machinery, and livestock was in 1880, $3,515; in 1890, $4,859; in 1900, $6,531.[2]

2. The average value, per farm, of lands with improvements, including buildings was in 1880, $2,835; in 1890, $3,930; in 1900, $5,358.[3]

3. The average value, per farm, of implements and machinery on farms: In 1880, $136 was in 1890, $151; in 1900, $208.[4]

The rate at which these several factors have increased will appear in the following:

[1] "No English agricultural labourer, in his most sanguine dreams, has the vista of occupying, still less of possessing, land. He cannot rise in his calling. He cannot cherish any ambition, and he is in consequence dull and brutish, reckless and supine."—Rogers: History of Agriculture and Prices, Vol. I, p. 693.

[2] Twelfth Census, Agriculture I, pp. 688 and 694.

[3] *Idem.*, pp. 688 and 696.

[4] *Idem.*, pp. 688 and 698.

	Base	*1880*	*1890*	*1900*
Average value of all farm property	$ 3,515	= 100	138.2	185.8
Average value of farms (land and improvements)	2,835	= 100	138.6	189.0
Average value of implements and machines	136	= 100	111.0	152.9
Farmers, planters and overseers	828,800	= 100	——	127.4
Agricultural laborers	352,565	= 100	——	173.6

WAGES UNDER HAND AND UNDER MACHINE METHODS

DAILY WAGES—WAGES OF SKILLED AND UNSKILLED WORKMEN

Touching the matter of daily wages for the same work under hand and under machine methods of production, the Thirteenth Annual Report of the Department of Labor is, probably, the best source of information. That report shows, in typical cases, the rates of wages paid for the different kinds of work required in the production of twenty-seven different farm crops by hand and by machine methods. The data in twenty-six cases are available for our present purpose.

It appears by that report that the lowest wage customarily paid, in the season of 1829–30, to any workman engaged in the production of wheat, by hand method, was 50 cents; the highest 75 cents. In 1895–96, the lowest daily wage reported for workmen engaged in the production of wheat, by machine method, was $1.50; the highest, $4.50. The average rate of wages for this work, in 1829–30, was 57 cents; in 1895–96, it was $2.47.[1] Collecting similar data from each of the twenty-six sets of usable returns, we have the following:

[1] The average here used is a weighted average, secured by dividing the total amount of wages paid by the total number of days work performed at the different rates of wages.

DAILY WAGES

Unit No.*	Crop.	Hand Labor Date.	Machine Labor Date.	Hand Method. Lowest.	Hand Method. Highest.	Machine Method. Lowest.	Machine Method. Highest.	Av. Daily Wages. Hand.	Av. Daily Wages. Machine.
1	Apple Tree	1870–2	1893–5	$ .85	$2.00	$ .85	$2.00	$1.56	$1.59
2	Apple Tree	1859–71	1893–5	.85	2.00	.85	2.00	1.56	1.28
3	Barley	1829–30	1895–6	.50	.75	1.50	4.50	.56	2.21
4	Beets	1850	1895	.40	.75	1.00	1.00	.69	1.00
5	Broom Corn	1860	1895	.50	1.00	1.25	1.50	.99	1.25
6	Carrot	1855	1895	.40	.75	.75	1.25	.62	1.01
7	Carrot	1850	1895	.40	.75	.75	1.25	.72	.90
8	Corn	1855	1894	.75	1.00	1.00	2.50	.78	1.53
9	Corn	1855	1894	.50	1.00	1.00	1.00	.94	1.00
10	Cotton	1841	1895	.50	.50	.50	1.00	.50	.99
11	Hay	1860	1894	.50	1.00	.75	1.25	.86	1.11
12	Hay	1850	1895	.50	1.00	.75	1.25	.83	1.05
13	Oats	1830	1893	.50	.75	1.25	2.50	.56	1.50
14	Onion	1850	1895	.40	.75	.75	1.25	.70	1.00
15	Peas	1856	1895	[1].62½	[1].62½	[1]1.00	[1]2.00	[1].62½	[1]1.04
16	Potato	1866	1895	1.00	1.00	1.00	1.00	1.00	1.00
17	Rice	1870	1895	1.00	1.00	.65	.65	1.00	.65
18	Rye	1847–8	1894–5	[1] .63	[1] .75	[1]1.00	[1]2.00	[1] .65	[1]1.05
19	Strawberry	1871–2	1894–5	. .	. .	. .	. .	1.30	1.38
20	Sugar Cane	1855	1895	1.00	1.00	.65	.65	1.00	.65
21	Sweet Potato	1861	1895	.50	1.00	.40	.80	.76	.62
23	Tobacco	1844	1895	[1] .75	[1] .75	[1]1.00	[1]1.00	[1] .75	[1]1.00
24	Tomato	1870	1895	.50	1.00	. .	. .	.93	.91
25	Turnip	1855	1895	.40	.75	.75	1.25	.59	.88
26	Wheat	1829–30	1895–6	.50	.75	1.50	4.50	.58	2.00
27	Wheat	1829–30	1895–6	.50	.75	1.50	4.50	.57	2.47

* See footnote "1", p. 21.

It is evident from an inspection of the foregoing table that the variation between the highest and lowest rates of daily wages is much greater under machine methods than under hand methods and that the average rate of wages is much higher under machine methods than under hand methods. An average of averages gives 83 cents for the hand method, $1.19 for machine method.

Of course, machine power is much more used in the production of some of these crops than in the production of others. In several cases, production is still almost wholly by hand method.[2] In such cases the

[1] With board.

[2] Thirteenth Annual Report, Dept. of Labor, p. 11.

data are not what they appear to be—a showing of hand method as compared with machine method,—but rather only a showing of production by hand method at different dates.

It will be worth our while to inquire in what way the introduction of machine power has affected the rates of wages for the work of producing these different crops. Turning first to a consideration of wages paid in the production of five crops, now largely produced by machine power, we collect the following data:

Unit Number	*Crop*	*Average daily wages*	
		Hand	*Machine*
3	Barley	$.56	$2.21
8	Corn	.78	1.53
11	Hay	.86	1.11
13	Oats	.56	1.50
27	Wheat	.57	2.47

An average of averages gives 66 cents for the hand methods and $1.76 for the machine method,—an increase of 166 per cent.

A similar showing for the five crops in which there appears to have been little or no change in the methods of production, is as follows:

Unit Number[1]	*Crop*	*Average daily wages*	
		Hand	*Machine*
2	Apple trees	$1.56	$1.28
16	Potatoes	1.00	1.00
19	Strawberries	1.30	1.38
21	Sweet potatoes	.76	.62
24	Tomatoes	.93	.91

An average of averages gives $1.11 as the average daily wage in the time of hand methods and $1.04 as the average daily wage in the time of machine methods,—a decrease of 6.7 per cent.

[1] See footnote 1 p. 21.

The position of the unskilled workman[1], meaning now the workman who is untrained in the use of machinery, is a peculiar one. In a lecture on ballad poetry, delivered at the University of Wisconsin in the Spring of 1903, Professor Moulton, of the University of Chicago, called attention to the fact that before the time of written literature the best literary productions were equally accessible to the free and to the unfree. The slave, as well as his master, might know and enjoy the choicest of literary productions. But, with the invention of writing and, especially, of printing, the best literature came to be put into book form. Books were expensive and the knowledge requisite for using them could be acquired only by a long and difficult course of training. From the very nature of the case, the best literature thus became inaccessible both to the slaves and to the poorer classes of freemen. They could gain no positive advantage from the new invention; and they lost, relatively, by reason of the intellectual gulf which opened between them and those others whose more fortunate stations gave both access to the written or printed volumes and afforded opportunity for learning how to use them.

This same process is now working itself out in the matter of labor and machinery. To the skilled

[1] There is, I think, a great deal of confusion and consequent misunderstanding arising from a loose use of the term "unskilled workman." We speak of paying higher wages to a skilled workman than to an unskilled workman; but, the essential element is not skill but efficiency. Skill, means rather proficiency, or dexterity, in the doing of a particular thing. It has reference to the person. But when we speak of a skilled machine workman, we have reference, not so much to the quality of the worker as to the quality of the work done, that is, to the product of his skill. The degree of skill which the machine workman possesses may, in fact, be much below that of the hand worker whom he displaces; but he is a more efficient workman and, therefore, commands the higher wage.

workman, machinery opens the way to profit and advancement. But to the unskilled workman, it is as a sealed, or unintelligible, book. He does not understand it; and the hopelessness of competing with one who does understand it, only intensifies his consciousness of inferiority and increases the burden of his struggle for existence.[1] Having, ordinarily, neither machinery nor the capacity for using it, he is practically shut out from all chance of participating in its benefits. His wages, of necessity, are limited by the standard of his efficiency. It is inevitable, therefore, that the unskilled laborer should, relatively, at any rate, sink ever lower and lower in the scale of industrial society.

That we have been experiencing a transition period, not only with respect to the agricultural industry [2] but, also, with respect to all other industries, seems almost self-evident. I do not believe that the transition period is passed, nor do I believe that it ever will be safely and finally passed, until the State, in the interest of the general welfare, and in its capacity of agent for the whole social body, shall have provided for and required, as now so all but universally provided for and required, in the more purely intellectual field, that every child shall be taught, at least, the rudiments of industrial art.

[1] "Under conditions where the laborer can offer no resistance and the so-called iron law of wages operates to keep him down to the life line, machinery only adds uncertainty to his other woes. He is, as it were, cut out of civilization. Whenever he presses upward and secures a larger share of an ever enlarging product, machinery becomes an uplifting force."—Henry White: "The Problem of Machinery," in *American Federationist*, Vol. X, p. 86.

[2] "The introduction of improved agricultural implements and machinery during the latter half of the nineteenth century was a development of such importance as to amount to an industrial revolution in agriculture."—Report of the Industrial Commission (1901), Vol. X, p. xiv.

MONTHLY WAGES—SYMPATHETIC VARIATIONS IN WAGE RATES

McMaster[1] cites authorities showing that, in 1794, "in the States north of Pennsylvania," the wages of common laborers did not exceed three dollars per month, while "in Vermont, good men were hired for eighteen pounds a year, which was equal to four dollars per month, and out of this found their clothes." Speaking of wages, generally, in 1802, he says:[2] "The average rate of wages the land over was . . . . . sixty-five dollars a year, with food, and, perhaps, lodging." In 1811, "throughout central Pennsylvania eight dollars per month of twenty-six working days, was paid to farm hands when fed and clothed."[3] At Adrian, Michigan, in 1849, according to an apparently reliable authority: "The most common labor with board is worth from $50 to $75 a year. A higher quality, in which some care and responsibility are added, is worth $100 to $120."[4] A similar report from Richmond, Massachusetts, made in the same year, states: "Men get from ten to sixteen dollars per month and boarded, for six months commencing in April."[5]

On the period from 1866 to 1899, I quote from a report of the Department of Agriculture,[6] as follows:

[1] McMaster: History of the People of the United States, Vol. II, p. 179.

[2] *Idem.* Vol. II, p. 617.

[3] *Idem.* Vol. III, p. 510.

[4] U. S. Patent Office Report, 1849–50, p. 186.

[5] *Idem.* 1849–50, p. 92.

[6] Division of Statistics, Misc. Bull. No. 22, p. 16.

WAGES OF FARM LABOR PER MONTH, BY YEAR OR SEASON, WITH BOARD, BY YEARS AND BY GEOGRAPHICAL DIVISIONS.[1]

	1899	*1898*	*1895*	*1894*	*1893*	*1892*	*1890*
U. States	$14 07	$13 43	$12 02	$12 16	$13 29	$12 54	$12 45
E. States	18 21	17 63	17 73	17 15	18 45	17 50	17 71
M. States	15 93	15 33	15 73	15 60	16 51	15 78	15 61
S. States	9 70	9 45	8 68	9 04	9 92	10 02	10 10
W. States	16 70	15 75	15 21	14 96	16 29	15 36	15 00
Mt. States	25 10	23 94	19 87	19 94	23 37	21 28	20 64
Pac. States	24 97	23 30	20 54	22 60	25 63	24 25	22 50

	1888	*1885*	*1882*	*1879*	*1875*	*1869*	*1866*
U. States	$12 36	$12 34	$12 41	$10 43	$11 07	$11 03	$12 38
E. States	17 21	16 70	16 92	13 03	16 18	15 29	14 77
M. States	15 41	15 24	14 71	12 37	14 78	12 25	13 33
S. States	9 90	9 90	9 92	8 46	8 65	7 03	7 62
W. States	15 09	15 20	15 60	12 75	13 43	11 36	12 09
Mt. States	21 99	19 74	27 08	— —	— —	— —	11 78
Pac. States	25 08	24 37	23 73	25 88	28 12	25 44	29 47

The Department of Agriculture has also reported on the "wages of farm labor per month, by year or season, with board," for the year 1902.[2] The average rate for

[1] The geographical divisions used in this table "are composed as follows: *Eastern States*—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut; *Middle States*—New York, New Jersey, Pennsylvania, Delaware; *Southern States*—Maryland, Virginia, South Carolina, North Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Indian Territory, Arkansas, Tennessee; *Western States*—West Virginia, Kentucky, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota; *Mountain States*—Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho; *Pacific States*—Washington, Oregon, California." Depart. of Agr.; Division of Statistics, Misc. Bull. No. 22, p. 16.

The data for the years prior to 1879 have been changed to a gold basis and a correction has been made, of what was evidently a clerical error, in the rate reported for the Western States in 1866. For the purpose of making this correction the cost of board in the Western States, in 1866, was assumed to have been the same as in the Pacific States where wages without board were practically the same at that date as in the Western States.

[2] Department of Agriculture (Div. of Stat.), Misc. Bull., No. 26, p. 15.

the whole United States is given as $16.40; but the average rates for the several geographical divisions are not given. In a letter dated September 16, 1904, the Secretary states that it was deemed unwise for the department so to extend the report on this last investigation. He suggests, however, that for the purposes of this study it would be allowable to make use of such "apparent" averages as are indicated by the published report. Agreeable to this suggestion, I have averaged the wages reported for the states in the several groups and secured the following as the average wage rates in 1902: Eastern States, $19.85; Middle States, $16.61; Southern States, $11.85; Western States, $19.48; Mountain States, $28.91; Pacific States, $27.90. These figures are averages of averages and must, therefore, be taken with some allowance. Accepting, as true, the average rate for the several states, as reported by the department, the rate here given for the Middle States is clearly too low since Delaware, whose wage rate was $13.81, is given equal weight with New York, whose wage rate was $19.65. The rate here given for the Pacific States is likewise too low since Oregon, whose wage rate was $25.98, is given equal weight with California, whose wage rate was $29.38. For the Southern and for the Western States the rate here given is probably too high, the highest rates being reported for the less populous states. For the other groups the rates here given are approximately correct.

By reference to the accompanying chart it may readily be seen that the average rate of wages for the whole of the United States was somewhat higher in 1899 and in 1902 than in 1866. It is very evident, however, that

the line of wages for the whole of the United States is very largely controlled by the wage rates in the "Southern States." It is hardly fair to strike an average of wages by considering together the wages of two such different classes of people as the whites and the blacks. We can avoid this incongruity for a considerable portion of the period under consideration.

Taking the number of agricultural laborers in the Mountain, Pacific, Eastern, and Western States (*i. e.*, the whole of the United States, exclusive of the Southern States), to have been in 1899, as reported in 1900, we find that the average rate of wages per month, with board, was, in 1899, 17.31.[1] In like manner, the average monthly wage, in the same region, in 1890, is found to have been $15.81; in 1879 it was $13.14;[2] in 1869 it was $12.29.[3] The increase in the average rate per month, during the period from 1869 to 1899, was 40.8 per cent.

[1] In getting this average, I found first the total number of agricultural laborers in each of the geographical divisions named and then found the total wage payment in each group at the rates given in the table on p. 65. The sum of these wage payments divided by the total number of agricultural laborers in all the groups, gives the quotient $17.31.

[2] The number of agricultural laborers in 1879 is assumed to have been the same as that reported in 1880 and the average rate of wages in the "Mountain States" is assumed to have been the same as was reported for the Pacific States.

[3] The number of agricultural laborers in 1869 is assumed to have been the same as was reported in 1870 and the average rate of wages in the Mountain States is assumed to have been the same as was reported for the Pacific States.

In the matter of the 20,321 agricultural laborers reported by the Ninth Census as being in the Territories, it should be noted that these have been apportioned somewhat arbitrarily, as follows: To the Mountain States, 15,000; to the Pacific States, 1,500; to the Western States, 3,821.

In the matter of general well-being the agricultural laborers, in the North, at any rate, have, of course, shared the homes of their employers; clothing has certainly been cheaper in late years; and, altogether, it seems safe to say that the condition of the dependent white agricultural laborers is much improved.[1]

The accompanying chart discloses a very strong tendency in the wage rates of the different parts of the country, especially in the region where white laborers are employed, to rise or fall together. The reason for this sympathetic fluctuation in rates lies, partly, in the somewhat characteristic dispositions of Americans to go wherever there is a prospect of more profitable employment,[2] and partly in the ready means of communication and

[1] "Eine weitere Verbesserung des Arbeitereinkommens ist in der vermehrten Kaufkraft des Geldes zu suchen. Sowohl die Kleidungsstücke als auch andere Gebrauchsartikel sind durch die hervorragende Anwendung der Machinenarbeit in der Industrie bedeutend im Preise heruntergegangen; dazu sind auch die Lebensmittel meistens billiger zu kaufen. Der Arbeitslohn ist also nicht nur im allgemeinen absolut, sondern auch im Verhältnis zu dem Preise der notwendigen Lebensmittel gestiegen. Inwieweit allerdings die landwirtschaftlichen Maschinen zur Verbilligung der Lebensmittel beigetragen haben, lässt sich zahlenmässig nicht bestimmen. Wir können uns sehr wohl denken, dass die Intensität des Betriebes, die Anwendung der Maschinen, die Produktion so gesteigert haben, dass sie eine Verbilligung der Lebensmittel zur Folge hatten . . . . . Wir denken dabei besonders an das klassische Land der Maschinenanwendung, an Amerika, welches noch vor wenigen Jahren der deutschen Getreideproduktion am gefährlichsten war. Wie hoch sind dort die Arbeitslohne und wie billig ist das Getreide!" Bensing: Einfluss der landwirtschaftlichen Maschinen, S. 73.

[2] "The United States perhaps affords the highest example of a body of labor prepared and equipped to seek its best market wherever that market may be." Walker: "Wages," p. 180.

"L'Americain de pur sang a cela de commun avec le Tartare, qu'il est campé et non fixé sur le sol que ses pieds foulent." M. Chevalier: Lettres sur l'Amerique du nord, Tome I, p. 196.

transportation.[1] That the fluctuations are most marked in the "Pacific" and "Mountain" States, is largely due to the less perfect means of communication and transportation and to the further fact that farming operations in those regions are rather closely confined to the production of a very few different crops, upon the productiveness of which depends practically the whole of the demand for labor.[2]

THE INFLUENCE OF MACHINERY UPON THE LIFE AND GENERAL WELFARE OF THE INDEPENDENT FARM OPERATORS

Statistical data showing the changed condition of the independent farm operators, separate and apart from the dependent operators, are not at hand. It will be worth while, however, to note what showing can be deduced concerning the income of the independent farm operators from the average income per agricultural worker during the twenty-year period from 1880 to 1900.

The value of agricultural products, per capita of person ten years of age and over engaged in agriculture, as reported by the Tenth, Eleventh and Twelfth Censuses

[1] "The mobility of capital and labor depend upon two factors, (a) means of transport, (b) knowledge of markets. Both of these elements have been influenced by machinery." Nicholson: Effects of Machinery on Wages, p. 104.

[2] "The greatest irregularity of employment, in the North, particularly in the Northwest, is found where the farmers are engaged in raising one or two staple crops to the neglect or exclusion of any wide system of diversified industry. . . . There was of that irregularity far more in the early days of the West than there is to-day, because the great central States of the North, where over half of our products are raised, are tending naturally and inevitably, though slowly, toward a diversity of crops that keep the men engaged on the farms for a greater relative proportion of the year; and thus irregularity of employment, owing to this change, is decreasing." L. G. Powers in Rpt. of Ind. Com. (1901), Vol. X, p. 172.

for the United States and for the several geographical divisions, was as follows:[1]

	1900	*1890*[2]	*1880*
United States	$454.37	$287.19	$286.82
North Atlantic div.	620.20	380.47	420.41
South Atlantic div.	229.01	175.46	165.26
North Central div.	672.59	357.05	369.39
South Central div.	269.19	206.89	187.87
Western div.	723.72	433.95	506.25

Considering only the data for the United States, as a whole, we have found[3] that in 1879, 1890 and 1899, the average monthly wage of dependent farm workers was, respectively, $10.43, $12.45, and $14.07, an increase of 34.9 per cent. in the twenty-year period. But the average value of agricultural products per farm worker for the years 1880, 1890, and 1900 was, respectively, $286.82, $287.19, and $454.37, an increase of 58.4 per cent. for practically the same twenty-year period.[4]

It is self-evident that if the increase in the income of the dependent class alone is represented by 34.9 per cent., while the increase in the income of all agricultural workers—dependent and independent taken to-

[1] For data of value of products see Twelfth Census, Agriculture I, p. 703. For number of persons in agriculture, see p. 93 of this study.

[2] The low valuation reported by the Eleventh Census was not the result of a decreased production; but rather, if it can be proper to use the term at any time, to an over-production. Take, for illustration, the case of corn: The corn crop produced in 1889 (the crop reported upon by the Eleventh Census), was so greatly in excess of the production in previous years that not only the price per bushel but the total value of the crop fell below that reported for any one of the nine preceding years. The same statement applies, more or less, to most of the staple farm crops for that year. See Dept. of Agr., Year Book (1901), pp. 699 *et seq.*

[3] See p. 65.

[4] Excluding the "Southern States," the corresponding showing for this twenty-year period is, for dependent workers, an increase of 31.7 per cent; for all farm workers, 71.2 per cent.

gether—is represented by 58.4 per cent., then the increase in the income of the independent class alone could be indicated only by a much higher number. How much higher we cannot tell, probably not less than 75 or 80 per cent. For the period from 1850 to 1900 the rate should, doubtless, be more than doubled.

The independent farmer of the present day, who has hired workmen, does not find it needful to work always at the same laborious tasks he sets for his employees. At harvest time, it is not the hired man but the farmer himself who tends the machines and does the lighter work. Farm buildings are more substantial and supplied with more conveniences than they were fifty, or even twenty, years ago. Good roads abound, and, probably not less than one-fourth of the farmers now have the advantages of a free delivery of mail.[1] Telephone service between farm houses and connecting with the neighboring towns, or cities, is by no means uncommon. Railway and electric car lines run through the farming districts and where formerly there was a back-country farm house there is now, not infrequently, a suburban home. These advantages enable the modern farmer to keep well abreast of the times and to inform himself concerning measures and events nearly, if not quite as well, as the average resident of the towns.[2]

[1] The Superintendent of Free Delivery, in a letter dated January 27 1903, stated that on February 1, 1903, there would "be 13,108 rural routes in operation" and that each carrier "serves an average of 100 families."

[2] "The social and ethical sides of farm life are also making progress through the freer intercourse with the world, afforded by improved highways and by the extension of trolley lines. The contact of the younger generation with the life of the city is making new and more progressive methods of living almost a necessity. To day, on many farms, the 'best room' is none too good for the family. Musical instruments are found in a large proportion of the country homes; a daily paper, some of the best magazines, and often the leading novel

It is rare indeed that the farmer of the present day cannot afford to send his children to school for at least six months of each school year during the greater portion of their school age. Our High Schools and Universities and especially our Agricultural Colleges which, twenty years ago, were hardly known, except on paper,[1] furnish ample evidence both of the greater interest of the farming classes in higher education and of their fitness for the higher lines of work.

Whether we look to the external signs of comfort and general welfare or to the character of the farm houses, there appears overwhelming evidence of a great change for the better with respect both to the dependent and independent classes,[2] the greater advantage appearing, however, to be in favor of the independent class.

To ascribe these improved conditions to the introduc-

of the day are not uncommon. . . . The attractiveness of our rural communities is growing. The movement of the population which has been so strongly toward the cities is now turning toward the country. Improved highways and the extension of trolley lines are bound to encourage this tendency. If formerly country people have sought homes in the cities, it is evident that the people of to-day are appreciating, as never before, that the country offers the strongest inducements for the building up of homes where health and the comforts of life can be enjoyed." Chas. S. Phelps: "Is there a Decadence of New England Agriculture," in *New Eng. Mag.*, Vol. 25, p. 382–3.

[1] Department of Agriculture, Year Book (1899), p. 173

[2] "But most have a false idea of farm life as it is to-day. The wife need not be the drudge she was once. Bearings have shifted, things are done differently, life runs smoother and better. More is accomplished with less wear of muscle and nerve. People work easier and do more, have greater leisure for recreation and self-culture. Much that the wife did formerly is provided for in other ways. . . . Advanced methods have made farming more profitable, easier indoors and out, have carried to the thinly settled country most of the refining influences and many of the advantages of city life." Clarence E. Blake: "Abandoned Farms as Homes for the Unemployed and City's Poor," in *New Eng. Mag.* (N. S.), Vol. 24, p. 582.

tion and use of machine power alone would, doubtless, be to overstate the truth, and yet, even waiving the impracticability of providing the requisite food supply by the earlier methods of culture, it is not at all clear that, under those earlier methods of heavy and exhaustive toil, men could be able effectively to interest themselves in affairs of government, social relations, and education in any degree comparable to that now common among the farming classes in this country.[1]

Consider how much lighter farm work now is than it was fifty years ago, before the introduction of machinery. How infinitely easier it must be to ride in the spring seat of a reaping machine, with no harder task at hand than that of keeping the horses out of the grain, than it would be to shuffle wearily along that same way, with bended back and with the perspiration springing from every pore, cutting an eight or ten foot cradle swath. And how much preferable to pitch sheaves to a threshing machine, or to work on the straw stack for a day or two than to labor all through the winter months flailing and winnowing grain.[2] It is much more delightful to have a sulky plow, with the option to walk or to ride, as inclination may direct, than to be compelled to trudge all day over the yielding soil, till your limbs grow heavy and you stumble at

[1] "The elimination of exhausting manual labor by the substitution of powerful machinery for puny arms has emancipated labor in our day from its hardest tasks, and has given to the worker both inclination and leisure for the development of his intellect in various ways that were impossible under former conditions." A. E. Outerbridge, Jr.: "Machinery and the Man," in Scientific American Supp., Vol. 51, p. 21235.

[2] "Threshing was then, as it remained till our time, when it has been almost superseded by machinery, the chief farm-work of the winter." Rogers: History of Agriculture and Prices, Vol. I, p. 15.

evening when you strike the beaten pathway leading to your home.[1]

The ultimate and general effect of machinery upon farm laborers and, of course, upon all farm workers, has been quite thoroughly and pretty accurately summarized as follows: "As to the influence of machinery on farm labor, all intelligent expert observation declares it beneficial. It has relieved the laborer of much drudgery; made his work easier and his hours of service shorter; stimulated his mental faculties; given an equilibrium of effort to mind and body; and made the laborer a more efficient worker, a broader man, and a better citizen."[2]

The work of women on the farms has been much lightened by machine power; not so much, however, by machines with the aid of which a woman does the same work as formerly as by machines which have taken the work entirely from the farm,[3] as for example, spinning and weaving, soap-making,[4] and candle-making,[5] which were formerly well-accepted parts of women's work on the farm and generally, also, in the towns. At the present time, throughout probably the greater part of the country, cheese and butter making is ordinarily done away from the farm and, in some parts of the country, as, for instance, in North Dakota, even the

[1] "To follow the team in the furrow, day after day, is very tiresome work and has the effect of giving the boy a heavy awkward gait by stiffening the lower limbs—a condition from which he seldom if ever recovers." M. L. Dunlap: U. S. Agricultural Report (1863), p. 417.

[2] J. R. Dodge: "American Farm Labor," in Rept. of Ind. Com. (1901), Vol. XI, p. 111.

[3] McMaster: History of the People of the United States, Vol. I, p. 97.

[4] Smith: Colonial Days and Ways, pp. 69 and 115.

[5] Earle: Home Life in Colonial Days, p. 35.

coming of a threshing crew fails to add materially to the work of the women on the farm, for the crews bring a cook-wagon and provide their own meals.[1]

Of the machines used by women on the farm, that of the sewing machine is, doubtless, first in importance; the washing machine and the apple-paring machine are contrivances of no mean worth. For the rest, there may be found, instead of the andiron and crane, or the 'Dutch oven' and 'out oven' of pioneer times,[2] very conveniently arranged stoves and ranges; also egg-beaters and can-openers and a host of other articles of which the house-wife of fifty years ago knew nothing, not to mention incubators, milk separators, etc. The most of these things belong rather in the class of tools and utensils; nevertheless, they indicate the lighter character of the work which women have now to do on the farms than fell to the lot of women before the era of machine power made such conveniences possible.

THE INFLUENCE OF MACHINERY UPON THE PHYSICAL AND MENTAL NATURE OF MAN

It may be assumed that the occupation of a man goes far toward determining his physical and mental health.[3] This fact is indeed, as I understand it, the basis of much of the argument both for and against the use of machine power. So far as routine work is concerned I venture to say that the evil is not inherent in, nor peculiar to the use of machine power.

The primary purpose and usual effect of the use of

[1] Report of the Industrial Commission (1901), Vol. X, p. 851.

[2] McMaster: History of the People of the United States, Vol. V, p. 154.

[3] Farr: Vital Statistics, p. 394 *et seq.*

any machine, is the production of utilities at a less expenditure of time, energy, and money.[1] But this is only another way of saying that, when aided by machine power, a given expenditure of time, energy, and money will produce a greater quantity of utilities. Utilities are the means of satisfying wants; and the satisfaction of wants is essential to life and happiness. The use of machinery, by supplying wants, does therefore, one of two things; either it "enables a larger number of persons to get a living", or it enables a given number "to get a better living."[2] Anyone will, I think, admit that the utilities supplied by machine power have not all been consumed in better livings. A very great part of this additional means of satisfying wants has been devoted to the maintenance of a more numerous population. That this is true must be self-evident when we consider how greatly the supply of utilities has been increased by the use of machinery,[3] and how utterly impossible it would be for the labor force now in existence, unaided by machinery, to provide even the ordinary necessities of life as we now count necessaries.[4]

[1] "Les outils ne sont que des machines simples et les machines ne sont que des outiles compliqués que nous ajoutons à nos bras pour en augmenter la puissance; et les uns et les autres ne sont, à beaucoup d'égards, que des moyens d'obtenir le concours des agens naturels. Leur résultat est évidemment de donner moins de travail pour obtenir la même quantité d'utilité, ou, ce qui revient au même, d'obtenir plus d'utilité pour la même quantité de travail humain." J. B. Say, Traité d'Economie Politique, p. 85.

[2] Powers: Labor Making Machinery, p. 27.

[3] See pp. 22–23.

[4] "Selbst der Aermste hat in unserer Arbeitstheilung doch mehr zu geniessen als wenn er im ungeselligen Zustand lebte: die bei uns am übelsten gestellt sind, Kränkliche ohne Vermögen, Familienväter mit allzu vielen Kindern, etc., würden im Urwalde einfach verhungern." Roscher: Grundlagen der Nationalökonomie (edition of 1900), p. 166.

By lightening the tasks of those who labor with their hands, and by increasing the quantity of the necessaries of life which a given amount of labor can procure, machinery has not only favored a higher standard of living, but has increased the chances of attaining it.[1] Moreover, the use of machine power has made it possible for many now to devote themselves wholly to intellectual pursuits without involving either the enslavement or the degradation of others.[2]

Looking at the question from the standpoint of the whole social body, there can be no other conclusion than that the use of machinery, by increasing the supply of utilities and by making utilities more accessible,[3] has

[1] "To-day the world obtains commodities of excellent quality at prices which even the preceding generation would have deemed incredible . . . . The poor enjoy what the rich could not before afford. What were the luxuries have become the necessaries of life. The laborer has more comforts than the farmer had a few generations ago. The farmer has more luxuries than the landlord had and is more richly clad and better housed. The landlord has books and pictures rarer, and appointments more artistic, than the king could then obtain." Carnegie: The Gospel of Wealth, p. 4.

[2] "If every instrument, at command, or from foreknowledge of its master's will, could accomplish its special work . . . . if the shuttle would weave, and the lyre play of itself; then neither would the architect want servants, nor the master slaves." Aristotle: "Politics" I, sec. 4 (Translation by Edward Walford.)

[3] "There is no fact in modern history more easily demonstrated than that the products of steam-driven machinery are mainly consumed by the common people—the masses." Gunton: Principles of Social Economics, p. 147.

"Quand je vous ai prouvé, messieurs, que l'introduction des machines expéditives, telles que le moulin à farine, ne diminue pas les moyens d'existence de la classes laborieuse, et n'a que l'inconvénient, assez grave à la vérité, de changer la nature de ses occupations, je n'ai pas complètement rendu justice aux machines. Le fait est que, dans la plupart des cas, elles sont favorables aux ouvriers mêmes dont elles semblaient sopprimer le travail. Tout procédé expéditif, en reduisant les frais de production, met le produit à la portée d'un plus grande numbre de consommateurs. L'expérience prouve même que le nombre des consommateurs s'augmente dans une proportion bien plus rapide que la baisse du prix." J. B. Say: Cours Complet d'Economie Politique, Tome I, p. 193.

opened the way to a greater number, not only to live and to work,[1] but to develop themselves and to make the most of themselves which their inherent qualities may allow.

With reference to the workers themselves, we may safely say that men who have worked for years with machinery are on the average, quite as strong and healthy and at least as intelligent, as were men employed in the same industries before machine power was introduced. They certainly compare most favorably, too, with the average workman among those who now have little or nothing to do with machinery.

That routine work, which is persisted in and made one's principal occupation long after the worker has fully mastered it and developed his efficiency in that line to the limit of his capacity, tends to narrow the intellectual field of the worker and to depress his spirit, may be freely admitted. The human mind is continually opening to new wants and seeking the means

[1] "In der Behauptung, dass die Maschinen viele Arbeiter brotlos machen, liegt etwas Wahres aber noch mehr Irriges. In gewissen Fällen werden allerdings viele Arbeiter infolge einer neu eingeführten Maschine brotlos, aber ganz falsch ist die Ansicht, dass die Bevölkerung überhaupt durch Einführung des Maschinenwesens vermindert werde. Die Ausdehnung des Maschinengebrauches ist sogar eine der Hauptursachen der gestiegenen Bevölkerung gewesen, denn dadurch wurde die Erzeugung von Nahrungsmitteln, Kleidern und anderen Gütern so vermehrt, dass viel mehr Menschen erhalten werden können. Nicht bloss eine allgemeine Vermehrung der Bevölkerung hat in den vergangenen Jahrzehnten stattgefunden, sondern auch selbst in solchen Gewerben, in welchen die Maschinenanwendung zugenommen hat, ist die Zahl der Arbeiter oft weit grösser geworden." F. G. Schulze: Nationalökonomie, Leipzig, 1856, S. 44. Quoted by Franz Bensing in "Der Einfluss der landwirtschaftlichen Maschinen." S. 5.

of satisfying them.[1] In proportion, therefore, as the ambition of the individual worker and his capacity for accomplishing new and greater tasks, prompt him to advance in any line of activities, just so will he tend to become despondent and dissatisfied and wearied with too long continuance in any routine employment. Under such conditions the health of the strongest worker must eventually give way.

It is to be noticed, however, that a certain amount of routine is good for a person. No one ever acquires any high degree of skill or proficiency in any line of work until he has thoughtfully and systematically repeated its essential features over and over and made the doing of the task a habit,—to be done, when occasion demands, with little or no thought concerning the manner of the doing. The every day business of dressing ourselves, or of walking, would involve an enormous waste of time and patience if we were compelled to learn anew each day; and the still more common routine employment of carrying food to our mouths and of chewing it, always in the same old way, would become unbearable if routine were of itself a thing detrimental to the well-being of persons and always to be avoided.

It is to be noted also, that routine work is not confined to those employments which require the use of machine power. As a matter of fact, machines can be used to advantage only when the thing to be done by the machine is routine work. The tendency is,

"[1] It is absurd to say that human beings can produce too much of everything needed for the satisfaction of human desire, since the satisfaction of one desire but awakens a new and wider desire, and there can be no end to the demands, the cravings, the yearnings of the being we call man." Henry George, Jr.: in *Chicago Record-Herald* of May 3, 1903.

therefore, always to give over to the machine,[1] the routine part of any work and to leave the more varied employment to the person in charge. The business of weaving, by the former hand method and by the present machine method, is a case in point.[2] Routine work is found quite as frequently in other occupations, as for example, in that of book-keeping, or of teaching music, or of repairing boots and shoes. It is accompanied, not infrequently, with heavy and exhaustive labor, as in the case of hod-carriers and of stone-masons. If we look to the business of many of our common laborers on the street, or on the railroads and canals, or at boat-wharves, we shall find many instances of routine employments such as the worst of machine-driven workmen, not only would not, but could not endure.

It is not so much the fact of routine or monotony of work as the far more serious fact of monotony of life which depresses and degrades the workman.[3] The

[1] "New machinery, when just invented, generally requires a great deal of care and attention. But the work of its attendant is always being sifted; that which is uniform and monotonous is gradually taken over by the machine, which thus becomes steadily more and more automatic and self-acting; till at last there is nothing for the hand to do, but to supply the material at certain intervals and to take away the work when finished." Marshall: Principles of Economics (3d ed.), Vol. I, p. 341.

[2] "Nothing could be more narrow or monotonous than the occupation of a weaver of plain stuffs in the old time. But now one woman will manage four or more looms, each of which does many times as much work in the course of the day as the old time hand-loom did and her work is much less monotonous and calls for much more judgment than his did." Marshall: Principles of Economics, (3d ed.), Vol. I, p. 342.

[3] "As Roscher says, it is monotony of life much more than monotony of work that is to be dreaded; monotony of work is an evil of the first order only when it involves monotony of life." Marshall: Principles of Economics, (3d ed.), Vol. I, p. 342.

boy, who is assigned lessons that are too hard for him, is disposed to quit his books, and he languishes if compelled to remain by them. On the other hand, if the tasks are suited to his capacity, and he masters them, he is usually proud of his achievements and anxious to do more; and if, instead of being assigned further work, he is required to do the same problems over and over again for, seemingly, no better object than that of being dutiful, he becomes dissatisfied and discouraged. In either case there is degradation and loss of power.

The grown up man is only an older boy. He delights to learn new things. He wants to be ever moving forward in the satisfaction of new wants; and if for any reason, as from the consciousness that the length of the working day or the intensity of his employment exacts too much for his strength or from a feeling that he is subject to some undue disadvantage, he finds that his natural powers are being over-taxed or that he cannot advance as rapidly as he thinks he should, he becomes dissatisfied and discouraged; and the longer he stays at his post, the less prepared he becomes to go into another employment. Hence arise the despair and abandon which leads to reckless living and, occasionally, to riot.

It is idle to say that the mere fact of working with a machine tends to narrow the intellectual capacity of the worker. As well might one say that it is injurious to a pupil to give attention to the more skillful work of his teacher.[1]

The mere fact of working with a machine and of being compelled to follow its orderly processes, tends

[1] "It is thought that educates,—the contact with quick and fertile minds; and it matters not whether this contact be produced by a voice or a book or a machine: the result is the same." Washington Gladden: Working People and their Employers, p. 20.

to develop in the mind of the operator, unless he be a perfect blockhead, a more or less perfect comprehension of the plan which was in the mind of the inventor. From having a conscious perception of the purpose of the inventor to noting defects in the means provided for the execution of it, is a step so easy and so obvious that it needs no discussion here. Every such conscious perception of an inventor's plan, or purpose, and every notation of defect in the means provided for its execution, involves a mental effort and a development of intellectual power just as certainly as, and, frequently, with far more beneficial results than, does the conjugation of a Greek verb or the reading of a page from the Aeneid. The operator of farm machinery is especially favored in this respect;[1] because, ordinarily he has charge of a complete machine and must understand it in order that he may keep it in repair.[2]

The simple fact that it requires the exercise of a certain degree of intelligence for the successful operation

[1] "Wer jemals eine landwirtschaftliche Maschine in ihrer Thätigkeit beobachtet und acht darauf gehabt hat, wie der Arbeiter sich drehen und wenden muss, wie er die grösste Aufmerksamkeit auf jede Bewegung der Maschine richten muss, wird zugeben, dass sie einen schädlichen Einfluss auf den geistlichen Zustand des Arbeiters nicht hat. Das Umgekehrte ist vielmehr der Fall. Die Arbeiter sind durch die Beschäftigung mit solchen Maschinen viel intelligenter und geschickter geworden, so dass es ihnen nicht nur möglich ist, in der Landwirtschaft einen guten Verdienst zu finden, sondern auch in anderen Gewerben. Ihre Erwerbsthätigkeit ist mit einem Wort durch die Maschinen eine bessere und höhere geworden, so dass ihnen jederzeit der Übergang von einem zum anderen Gewerbe ermöglicht ist. Das ist unstreitig ein Vorteil, den der landwirtschaftliche Arbeiter durch die Beschäftigung mit Maschinen vor dem industriellen voraus hat." —Bensing: Der Einfluss der landwirtschaftlichen Maschinen, S. 76.

[2] "On the whole the effect of the use of machinery has been to raise the intelligence and skill required on the part of those who use it, whether hired laborers or farm owners, and this is said to have resulted in improving the intellectual status of the American farmer."—Rept. of Ind. Com. (1901), Vol. X, p. xiv.

of a machine, together with the well known fact that machine workmen continue to command higher wages than other workmen engaged in the same industries, should be conclusive evidence that the use of a machine does not impair the intellect of the operator. Anyone may be presumed to know that it requires a higher grade of intellect to operate a steam-plow than it does to operate a hoe, and that the operator of the steam-plow commands the higher wage.

It is significant of the mutual relationship between the possession of intellectual power and the ability to operate machinery that, according to the returns of the Twelfth Census, the North Atlantic States, having 44.2 per cent of the total population of the country ten years of age and over engaged in manufactures, mechanic arts, trade, and transportation, reported only 15.8 per cent of the total number of illiterates, ten years of age and over, and only 27.9 per cent of the total number of deaths, occurring during the census year, from "injuries by machinery"; while the Southern States (South Atlantic and South Central divisions), having but 16.9 per cent of the total number, ten years of age and over, engaged in manufactures, mechanic arts, trade, and transportation, reported 66.9 per cent of the total number of illiterates, ten years of age and over, and 39.6 per cent of the total number of deaths from "injuries by machinery."[1]

It is safe to say that the people in the Southern States employ, relatively, even less of machinery in agri-

[1] For the number of persons engaged in manufactures, mechanic arts, trade and transportation, see page 93.

For statistics of illiteracy see Twelfth Census, Population II, p. C.

The total number of deaths, reported as resulting from "injuries by machinery," was 333; of these 80 were reported from the North Atlantic States and 132 from the South Atlantic and South Central States.—Twelfth Census, Vital Statistics II, Table 7.

culture than they do in manufactures, mechanic arts, trade, and transportation. Accepting this as a fact, and bearing in mind the showing above made touching the matter of education and the personal injuries resulting from the use of machinery, it is not difficult to concur in the opinion of the English writer who held that "the expense of ignorance is the greatest in the obstructions which it presents to the introduction of machinery;" that "notwithstanding the progress of machinery in agriculture, there is probably as much sound practical labour-saving invention and machinery unused, as there is used; and that it is unused solely in consequence of the ignorance and incompetence of the work-people." [1]

THE USE OF MACHINERY AND THE LENGTH OF THE WORKING DAY

The length of the working-day is shorter now than formerly, This shorter working-day is, however, only very indirectly a consequence of the use of machinery. So far as the individual employer is concerned it would be quite correct to say that the shorter working-day is, not so much because of, as in spite of, his use of machinery.

Every employer of labor expects to further his own interests by giving employment to others. Of course it may happen, and doubtless does happen occasionally,

[1] Edwin Chadwick, Esq.: *Journal of the Statistical Society*, Vol. 25, p. 516.

"The less general use of improved machinery in the South than in other sections is cited in partial explanation of the slow rate of agricultural progress in that country and is itself explained by the lack of mechanical skill on the part of the negroes and by the cheapness of labor, which makes it more economical to employ hand labor in many operations which would be more cheaply done by machinery where labor is more expensive."—Rept. of Ind. Com. (1901), Vol. X, p. xiv.

that men offer employment for the sake of the employee, but wages paid for such employment are really charity offerings in disguise. They have no part in a discussion concerning the usual and every-day relations between employers and employees.

In like manner we may say that every employee expects, in return for any service which he renders, to receive a certain payment which shall yield him a net return of satisfaction above sacrifice. Not only does he expect a net return, but he expects a higher net return of satisfaction above sacrifice than he could otherwise secure. In other words, he expects that it will be better or more profitable, for him to undertake the employment offered, on the terms proposed, than to decline it and, perhaps continue unemployed. Unless the workman has such an expectation, he should not undertake the work. It is not only proper,[1] but most desirable that both the employer and the employee should have their expectations realized.

What is the attitude of the parties with respect to each other? Assuming a certain length of working day, the position of the machine-using employer has been well stated by an English factory inspector as follows: "The quantity produced must, in the main, be regulated by the speed of the machinery; it must be the interest of the mill owner to drive it at the utmost rate of speed consistent with these following conditions, viz., the preservation of the machinery from too rapid deterioration; the preservation of the quality of the article manufactured; and the capability of the workman to follow the motion without a greater exertion

[1] "In an ordinary contract both parties may, and usually do, gain by entering into the agreement." Amer. and Eng. Enc. of Law, (2d ed.), Vol. XIV, p. 582.

than he can sustain for a constancy."[1] In short, it is the interest and purpose of the employer to so manage his establishment that he may secure from it the highest net return. He is producing for a market, and the more promptly he can supply the demands of that market the greater are his chances of making a profit; and hence the need for "the utmost rate of speed," and also for the most constant operation of the factors of production consistent with the conditions named. "The highest result with the least expenditure of means,"[2] is the motto of the employer.

One factor, the machine, can work almost continuously day and night; and its efficiency is the same for the twenty-fourth hour as for the first hour or for any intermediate hour. Indeed, except as occasional stops may be requisite in order that the machine be kept in repair, the more continuously it is kept at work the less likely it is to deteriorate and the less likely that it will become worthless by reason of the invention of a better machine. Whether we consider the work of a machine for a day, for a year, or for its whole life-time as a producing agent, it is most effective and yields the highest net return to its owner when operated almost continuously.

The other factor, the workman, cannot work continuously for any great length of time. There must be portions of each day given to rest and recuperation; and the efficiency of the workman in the last hour of a long working-day is much less than in any other hour, unless, perhaps, in the first. In the average employment requiring the use of little or no machinery, we may assume that the first hour's work of each work-

[1] See Karl Marx: Capital, p. 413.

[2] Brooks: The Social Unrest, p. 201.

ing day is worth less than that of the second, or of the third, etc. But after the sixth or seventh hour the workman becomes increasingly less efficient. Moreover, if he works beyond his strength in any one day, and still more, if he works beyond his strength for any considerable length of time, he loses vitality; and loss of vitality, whatever may be the determining cause, means, inevitably, the degradation of the workman and a permanently decreased efficiency.[1]

The employer who is seeking the highest net return from an investment in labor should, therefore, if he is wise, be guided by a very different rule, in fixing the working-day for a man, from that which he should follow in fixing the length of the working-day for a machine.

If the term of employment is for a day only, and fresh workmen can be secured for each succeeding day, it may pay the employer to crowd his employees, to the utmost limit of their strength throughout, perhaps, the full twenty-four hours of the day. But if the term of employment is for a year, or for life, with no chance of getting a substitute, then it will, ordinarily,[2] pay an employer to be more saving of his employees' vitality. He must now look to the preservation of the health and strength of his employees for the longer period of employment. It is only in this way that the employer can secure the highest net return on his investment. We know, however, that employers are sometimes both

[1] Walker: Wages, pp. 81–88.

[2] "Slave-labour, under an intelligent profit monger, may require provision to be made for a full working life, though even in slavery it may sometimes pay to use up a slave by intense toil during a shorter period." John A. Hobson: The Economics of Distribution, p. 162.

unwise [1] and unscrupulous [2] and that even in cases of employment for long periods, employers will, not infrequently, discount the future at too high a rate and overwork their employees. The temptation to do this way is especially strong when free laborers are employed because the services of a freeman are not ordinarily paid for in advance and for the whole period of possible employment, as in the purchase of a slave, but day by day, or month by month, and the death or total disabiliy of the freeman relieves the employer from paying for the latter portion of the stipulated term, that is for that portion of the term when the overworked laborer is least efficient. Moreover, except as provided for by the employer's liability acts, the employer of free labor has no financial interest in the welfare of a workman after the stipulated period of service is in any way terminated.

[1] "I challenge the assumption which underlies the orthodox doctrine of wages, namely, the sufficiency of the sense of self interest. Mankind, always less wise, and too often foolish to the point of stupidity, on the one side, and of fanaticism, on the other, whether in government, in domestic life, in the care of their bodies, or in the care of their souls, do not suddenly become wise in industrial concerns. The argument for keeping a laborer well applies with equal force to the maintenance of a slave." Francis A. Walker: Wages, p. 58.

"It shocks us to-day to hear the allegation that slaveowners once discussed in convention the expediency of using a slave up in six years or four years in a certain occupation, and decided that it 'paid' to use him up in four." Ely: Outlines of Economics, p. 182.

[2] "Certainly, it seldom happens that any one in the position of a monopolist with respect to the purchase of labor power will look ahead for years and ask, Is not the course I am pursuing likely to diminish the labor supply? We do not find any action on the part of the purchaser of labor power which would indicate that this is the case. Take the example of the sweater and his victims. We do not find that he is held back from exercising his full power over them by the fear that he will cut off the future supply of labor power. He thinks that it will be forthcoming from some source; but even if not, he thinks, before the supply dries up I will reap my harvest; I will make my fortune." Ely: Monopolies and Trusts, p. 132.

Ambitious men will even overwork themselves. It is too much to expect that they should, voluntarily, be more solicitous for the welfare of their employees.

We have now to inquire concerning the effect of yoking together the machine and labor factors,—the one yielding the highest net return, when worked almost incessantly, either for short or for long terms of employment; the other yielding the highest net return when worked for longer or shorter periods, according to the length of the term of employment, but always, unless in the case of employment for a single day, when considerable portions of each day are allowed for rest and recuperation. It is like harnessing together a racer and a plow horse. From the standpoint of the employer, the machine and labor factors do not work in harmony. Under any conditions the employer is interested in getting as much service as possible from his employee and, when using machinery, is constantly impelled, according to the amount of his investment in the machine factor[1] to spur on the labor factor to a longer working day.

The position of the employee is radically different from that of the employer. When making a contract for the sale of his labor power, the employee does not seek to establish a long working day. He wants a certain amount of exercise, and he may even be glad to do some work for the pleasure which comes of achievement, but a long working day, or a day of intense or otherwise exhaustive toil, is not desired. Not infre-

[1] "As machinery became more and more costly, the length of the working-day was lengthened until it became, even for women and children, sixteen and eighteen hours in cases not rare. Indeed, it has been generally longer where women and children have been the predominating labor force, because they are less powerful to resist oppression."—Ely: Labor Movement in America, p. 109.

quently, the employee assumes a position antagonistic to the interests of his employer. There remains, therefore, a wide margin within which the interests of employers and employees are adverse to each other; and the immediate effect of the introduction of machinery is rather to widen that area than to narrow it.

It would doubtless be impossible to enumerate all of the causes which have operated to give a shorter working day in the more recent years. Public opinion has doubtless had some influence in this direction; but, for the most part, the various causes have found expression in, and have operated through, factory and labor laws.

Just how far the legislation thus far enacted in behalf of employees has operated to give farm laborers a shorter working day it would, doubtless, be impossible to say. That the farm laborers have, in some degree, profited by such legislation may be fairly inferred from the testimony presented before the recent Industrial Commission and summarized in the report of that Commission as follows: "Returns relative to the hours of daily service show the influence of general labor agitation for shorter hours in shortening the day of rural service. The reduction is very general, and greater where industrial and mechanical enterprise is dominant."[1]

It is to be expected, however, that the working-day should be longer on the farms than in the factories, for the outdoor life and more varied nature of the employment promotes health and makes it possible for farm workmen to continue their work through a given period with, relatively, much less cost of vitality.

That this is true will appear fairly evident from a

[1] Report of Industrial Commission (1901), Vol. XI, p. 82.

consideration of the following table taken from Dr. Amos G. Warner's work on "American Charities."[1]

NUMBER LIVING AT STATED AGES OUT OF 1,000 LIVING AT AGE OF 25.

	Ages			
	35	*45*	*55*	*60*
Farmer[2]	898.5	821.19	730.06	639.54
Shoemaker	908.8	812.45	690.65	591.64
Weaver	920.3	822.78	696.04	581.20
Grocer	923.7	826.68	696.02	617.38
Blacksmith	918.8	804.84	672.02	547.02
Carpenter	905.5	812.18	676.58	576.38
Tailor	883.7	758.17	631.58	544.10
Laborer	902.1	789.35	652.85	557.51
Miner	915.1	810.79	646.97	535.69
Baker	924.1	787.35	620.51	518.04
Butcher	887.0	740.64	569.47	451.41
Innkeeper	861.7	684.99	491.13	395.38

As a matter of fact, the length of the working day, the conditions under which work shall be done, and the wages to be paid in any industry, are questions which must all, ultimately, be determined by economic law[3] and, to a very large extent, independently for each

[1] Warner: American Charities, p. 107.

[2] "The farmers and agricultural laborers are at present among the healthiest classes of the population classified according to occupation. The young farmer for some reason or other suffers a higher mortality than the labourer; but at 35 and upward the British farmer enjoys comforts which are beyond the reach of the labourers."—Farr: Vital Statistics, p. 403.

[3] "If men can produce as much or nearly as much in eight hours as they can in ten, eight hours is destined to become the working day; otherwise not. The owner of a stoneyard in Chicago has stated that his men could do as much work in eight hours as in ten hours. Their work is fatiguing and little or nothing is gained by working the men over eight hours. Eight hours was the day's labor in that yard, and the owner said so far as his business was concerned the eight-hour question had solved itself."—Powers: Labor Making Machinery, p. 33.

industry according to the nature of the work to be done and according to the character of the workers. But the economic law by which they are to be determined is not necessarily the economic law which is most favorable to employers, or to employees, nor even to the interest of employers and employees jointly considered, any more than the policy of our federal government is to be determined by the civil law most favorable to any particular state or section of the Union. Such questions are to be determined by that economic law which is most favorable to the whole social body,—to the state,—to humanity.[1]

[1] "Ausgangspunkt, wie Zielpunkt unserer Wissenschaft ist der Mensch"—Roscher: Grundlagen der Nationalökonomie, S. 1.

[NOTE.—The tables which follow, and upon which the calculations in this study are based, will be found to differ in some particulars from the corresponding tables in the Twelfth Census special report on occupations. The foot-notes connected with the several tables show the sources upon which I relied in making them. Further than this I need add only that my tables were completed early in 1903—over a year before the publication of the census report referred to —H. W. Q.]

TOTAL NUMBER OF PERSONS, TEN YEARS OF AGE AND OVER, IN THE SEVERAL OCCUPATION CLASSES IN 1870, 1880, 1890, AND 1900—CLASSIFICATION OF THE TWELFTH CENSUS[1]

	Agriculture	*Prof. Services*	*Dom. and Pers.*	*Trade and Trans.*	*Mfg. and Mech. Arts*
UNITED STATES					
1900	10,381,765	1,258,739	5,580,657	4,766,964	7,085,992
1890	8,565,926	944,333	4,220,812	3,326,122	5,678,468
1880	7,713,875	603,202	3,423,815	1,866,481	3,784,726
1870	5,948,561	371,098	2,277,587	1,228,823	2,679 854
NORTH ATLANTIC DIVISION					
1900	1,074,412	411,279	1,857,069	1,867,805	3,368,710
1890	1,099,465	299,468	1,467,628	1,316,779	2,788,120
1880	1,048,442	207,551	1,211,958	828,802	2,012,969
1870	1,020,440	139,809	878,064	584,672	1,483,608
SOUTH ATLANTIC DIVISION					
1900	2,032,569	119,360	798,837	422,272	627,653
1890	1,669,014	92,361	581,127	308,751	466,803
1880	1,622,081	62,309	517,429	177,436	298,507
1870	1,272,873	39,778	349,164	118,217	215,740
NORTH CENTRAL DIVISION					
1900	3,508,808	478,237	1,759,936	1,671,015	2,162,917
1890	3,117,043	371,347	1,328,853	1,151,139	1,705,456
1880	2,735,525	230,622	1,025,089	595,791	1,038,096
1870	2,043,984	131,821	652,225	363,638	703,642
SOUTH CENTRAL DIVISION					
1900	3,300,817	152,381	793,549	475,931	487,077
1890	2,321,694	114,263	524,165	315,318	360,374
1880	2,120,525	73,455	464,909	161,449	201,835
1870	1,499,316	46,751	293,287	111,347	145,514
WESTERN DIVISION					
1900	465,159	97,482	371,266	329,941	439,635
1890	358,710	66,894	319,039	234,135	357,715
1880	187,302	29,265	204,430	103,003	233,319
1870	111,948	12,939	104,847	50,949	131,350

[1] The data for the years 1890 and 1900 are taken from the Report of the Twelfth Census, Population II, pp. cxxxv–cxxxvi.

The data for the years 1870 and 1880 are derived from the Report of the Eleventh Census, Population II, pp. cix–cx. Corrections being made as indicated in the Report of the Twelfth Census, Population II, p. cxxvii. The correction is complete except in the case of "Officials of Mining and Quarrying Companies" for the year 1880. These were not separately reported in that year and hence correction was impossible as to them.

TOTAL NUMBER OF MALES, TEN YEARS OF AGE AND OVER, IN THE SEVERAL OCCUPATION CLASSES, IN 1870, 1880, 1890, AND 1900—CLASSIFICATION OF TWELFTH CENSUS[1]

	Agriculture	*Prof. Services*	*Dom. and Pers.*	*Trade and Trans.*	*Mfg. and Mech. Arts*
UNITED STATES					
1900	9,404,429	828,163	3,485,208	4,263,617	5,772,788
1890	7,887,042	632,646	2,553,161	3,097,701	4,650,540
1880	7,119,365	425,947	2,242,309	1,803,629	3,153,692
1870	5,551,593	278,841	1,304,430	1,208,995	2,325,776
NORTH ATLANTIC DIVISION					
1900	1,039,729	270,254	1,165,352	1,629,782	2,629,848
1890	1,078,791	192,797	890,856	1,201,302	2,179,295
1880	1,043,497	136,572	774,767	790,344	1,587,867
1870	1,017,751	95,853	514,160	571,106	1,221,885
SOUTH ATLANTIC DIVISION					
1900	1,697,623	81,949	418,784	389,390	505,345
1890	1,421,695	66,791	271,493	291,228	380,580
1880	1,358,072	49,168	289,342	170,702	252,208
1870	1,088,122	33,572	156,037	115,394	189,468
NORTH CENTRAL DIVISION					
1900	3,408,789	299,297	1,162,678	1,489,968	1,822,671
1890	3,036,880	236,730	854,956	1,076,163	1,456,420
1880	2,720,123	156,419	714,686	582,458	914,347
1870	2,037,688	97,011	402,982	361,354	654,120
SOUTH CENTRAL DIVISION					
1900	2,808,511	109,401	452,563	450,308	417,151
1890	1,997,805	86,914	277,033	304,360	306,933
1880	1,811,486	61,011	283,271	158,314	178,177
1870	1,296,652	41,231	140,623	110,372	132,846
WESTERN DIVISION					
1900	449,777	67,262	285,831	304,169	397,773
1890	351,871	49,414	258,823	224,648	327,312
1880	186,187	22,777	180,243	101,811	221,093
1870	111,380	11,174	90,628	50,769	127,457

[1] See footnote, page 93.

TOTAL NUMBER OF FEMALES, TEN YEARS OF AGE AND OVER, IN THE SEVERAL OCCUPATION CLASSES IN 1870, 1880, 1890, AND 1900—CLASSIFICATION OF THE TWELFTH CENSUS[1]

	Agriculture	*Prof. Services*	*Dom. and Pers.*	*Trade and Trans.*	*Mfg. and Mech. Arts*
UNITED STATES					
1900	977,336	430,576	2,095,449	503,347	1,313,204
1890	678,884	311,687	1,667,651	228,421	1,027,928
1880	594,510	177,255	1,181,506	62,852	631,034
1870	396,968	92,257	973,157	19,828	354,078
NORTH ATLANTIC DIVISION					
1900	34,683	141,025	691,717	238,023	738,862
1890	20,674	106,671	576,772	115,477	608,825
1880	4,945	70,979	437,191	38,458	425,102
1870	2,689	43,956	363,904	13,566	261,723
SOUTH ATLANTIC DIVISION					
1900	334,946	37,411	380,053	32,882	122,308
1890	247,319	25,570	309,634	17,523	86,223
1880	264,009	13,141	228,087	6,734	46,299
1870	184,751	6,206	193,127	2,823	26,272
NORTH CENTRAL DIVISION					
1900	100,019	178,940	597,258	181,047	340,246
1890	80,163	134,617	473,897	74,976	249,036
1880	15,402	74,203	310,403	13,333	123,749
1870	6,296	34,810	249,243	2,284	49,522
SOUTH CENTRAL DIVISION					
1900	492,306	42,980	340,986	25,623	69,926
1890	323,889	27,349	247,132	10,958	53,441
1880	309,039	12,444	181,638	3,135	23,658
1870	202,664	5,520	152,664	975	12,668
WESTERN DIVISION					
1900	15,382	30,220	85,435	25,772	41,862
1890	6,839	17,480	60,216	9,487	30,403
1880	1,115	6,488	24,187	1,192	12,226
1870	568	1,765	14,219	180	3,893

[1] See footnote, page 93.

PER CENT OF PERSONS IN THE SEVERAL OCCUPATION CLASSES OF THE TOTAL NUMBER IN OCCUPATION CLASSES, IN 1870, 1880, 1890, AND 1900.—(CLASSIFICATION OF 1900).[1]

	Agriculture	*Prof. Services*	*Dom. and Pers.*	*Trade and Trans.*	*Mfg. and Mech. Arts*
UNITED STATES					
1900	35.7	4.3	19.2	16.4	24.4
1890	37.7	4.1	18.6	14.6	25.0
1880	44.3	3.5	19.7	10.7	21.8
1870	47.6	3.0	18.2	9.8	21.4
NORTH ATLANTIC DIVISION					
1900	12.5	4.8	21.6	21.8	39.3
1890	15.8	4.3	21.0	18.9	40.0
1880	19.8	3.9	22.8	15.6	37.9
1870	24.9	3.4	21.4	14.2	36.1
SOUTH ATLANTIC DIVISION					
1900	50.8	3.0	20.0	10.5	15.7
1890	53.5	3.0	18.6	9.9	15.0
1880	60.6	2.3	19.3	6.6	11.2
1870	63.8	2.0	17.5	5.9	10.8
NORTH CENTRAL DIVISION					
1900	36.6	5.0	18.4	17.4	22.6
1890	40.6	4.9	17.3	15.0	22.2
1880	48.6	4.1	18.2	10.6	18.5
1870	52.5	3.4	16.7	9.3	18.1
SOUTH CENTRAL DIVISION					
1900	63.4	2.9	15.2	9.1	9.4
1890	63.9	3.1	14.4	8.7	9.9
1880	70.2	2.4	15.4	5.3	6.7
1870	71.5	2.2	14.0	5.3	7.0
WESTERN DIVISION					
1900	27.3	5.7	21.8	19.4	25.8
1890	26.8	5.0	23.9	17.5	26.8
1880	24.7	3.9	27.0	13.6	30.8
1870	27.2	3.1	25.4	12.4	31.9

[1] See footnote, p. 93.

PER CENT OF MALES IN THE SEVERAL OCCUPATION CLASSES OF THE TOTAL NUMBER OF MALES IN OCCUPATION CLASSES IN 1870, 1880, 1890 AND 1900.—(CLASSIFICATION OF 1900).[1]

	Agriculture	*Prof. Services*	*Dom. and Pers.*	*Trade and Trans.*	*Mfg. and Mech. Arts*
UNITED STATES					
1900	39.6	3.5	14.7	17.9	24.3
1890	41.9	3.4	13.6	16.4	24.7
1880	48.3	2.9	15.2	12.2	21.4
1870	52.1	2.6	12.2	11.3	21.8
NORTH ATLANTIC DIVISION					
1900	15.4	4.0	17.3	24.2	39.1
1890	19.4	3.5	16.1	21.7	39.3
1880	24.1	3.2	17.9	18.2	36.6
1870	29.8	2.8	15.0	16.7	35.7
SOUTH ATLANTIC DIVISION					
1900	54.9	2.7	13.5	12.6	16.3
1890	58.5	2.7	11.2	12.0	15.6
1880	64.7	2.3	13.6	8.0	11.9
1870	68.7	2.1	9.9	7.3	12.0
NORTH CENTRAL DIVISION					
1900	41.7	3.7	14.2	18.2	22.2
1890	45.6	3.5	12.8	16.2	21.9
1880	53.5	3.1	14.0	11.4	18.0
1870	57.4	2.7	11.3	10.2	18.4
SOUTH CENTRAL DIVISION					
1900	66.3	2.6	10.7	10.6	9.8
1890	67.2	2.9	9.3	10.3	10.3
1880	72.7	2.4	11.4	6.4	7.1
1870	75.3	2.4	8.2	6.4	7.7
WESTERN DIVISION					
1900	29.9	4.5	19.0	20.2	26.4
1890	29.0	4.1	21.4	18.5	27.0
1880	26.1	3.2	25.3	14.3	31.1
1870	28.5	2.8	23.1	13.0	32.6

[1] See footnote, p. 93.

PER CENT OF FEMALES IN THE SEVERAL OCCUPATION CLASSES OF THE TOTAL NUMBER OF FEMALES IN OCCUPATION CLASSES IN 1870, 1880, 1890, AND 1900 (CLASSIFICATION OF 1900).[1]

	Agriculture	*Prof. Services*	*Dom. and Pers.*	*Trade and Trans.*	*Mfg. and Mech. Arts*
UNITED STATES					
1900	18.4	8.1	39.4	9.4	24.7
1890	17.3	8.0	42.6	5.8	26.3
1880	22.5	6.7	44.6	2.4	23.8
1870	21.6	5.0	53.0	1.1	19.3
NORTH ATLANTIC DIVISION					
1900	1.9	7.6	37.5	12.9	40.1
1890	1.4	7.5	40.4	8.1	42.6
1880	0 5	7.3	44.8	3.9	43.5
1870	0.4	6.4	53.0	2.0	38.2
SOUTH ATLANTIC DIVISION					
1900	36.9	4.1	41.9	3.6	13.5
1890	36.0	3.7	45.1	2.6	12.6
1880	47.3	2.3	40.9	1.2	8.3
1870	44.7	1.5	46.7	0.7	6.4
NORTH CENTRAL DIVISION					
1900	7.2	12.8	42.7	13.0	24.3
1890	7.9	13.3	46.8	7.4	24.6
1880	2.9	13.8	57.8	2.5	23.0
1870	1.8	10.2	72.8	0.7	14.5
SOUTH CENTRAL DIVISION					
1900	50.7	4.4	35.1	2.6	7.2
1890	48.9	4.1	37.3	1.6	8.1
1880	58.3	2.3	34.3	0.6	4.5
1870	54.1	1.5	40.8	0.2	3.4
WESTERN DIVISION					
1900	7.7	15.2	43.0	13.0	21.1
1890	5.5	14.1	48.4	7.6	24.4
1880	2.5	14.4	53.5	2.6	27.0
1870	2.7	8.5	69.0	0.9	18.9

[1] See footnote, p. 93.

FARMING POPULATION IN 1880, 1890, AND 1900.[1]

	Agriculutral laborers		*Farmers, planters and overseers*	
	Male	*Female*	*Male*	*Female*
UNITED STATES				
1900	3,747,668	663,209	5,367,169	307,706
1890	2,556,957	447,104	5,055,130	226,427
1880	2,788,976	534,900	4,172,049	57,002
NORTH ATLANTIC DIVISION				
1900	410,856	3,827	587,550	30,019
1890	353,580	2,277	671,429	17,233
1880	344,512	1,372	666,299	3,041
SOUTH ATLANTIC DIVISION				
1900	780,073	267,518	873,147	66,657
1890	613,407	198,203	773,834	48,241
1880	706,651	244,615	634,464	18,808
NORTH CENTRAL DIVISION				
1900	1,209,612	13,531	2,125,701	84,656
1890	772,455	5,561	2,191,542	73,083
1880	840,966	4,133	1,832,623	10,678
SOUTH CENTRAL DIVISION				
1900	1,189,470	376,361	1,565,384	114,895
1890	716,060	240,477	1,240,801	82,333
1880	849,170	284,537	936,274	23,778
WESTERN DIVISION				
1900	157,657	1,972	215,387	11,479
1890	101,455	586	177,524	5,537
1880	47,677	243	102,389	697

[1] Twelfth Census, Population II, pp. 510 *et seq.*; Eleventh Census, Population II, pp. 306 *et seq.*; Tenth Census, Population, pp. 760 *et seq.*

FARMING POPULATION IN THE SEVEN LEADING CEREAL PRODUCING STATES, IN 1880, 1890 AND 1900.[1]

	Agricultural laborers		*Farmers, planters and overseers*	
	Male	*Female*	*Male*	*Female*
SEVEN STATES				
1900	605,596	6,822	1,022,123	34,114
1890	357,565	2,329	1,057,665	34,202
1880	350,947	1,618	824,362	4,438
ILLINOIS				
1900	183,272	1,687	257,790	10,159
1890	125,137	827	285,644	11,885
1880	150,190	717	279,423	1,754
IOWA				
1900	132,290	1,160	227,482	6,846
1890	73,753	403	236,338	7,515
1880	88,045	354	210,928	973
KANSAS				
1900	88,462	809	172,337	5,682
1890	47,965	234	192,452	6,387
1880	54,725	177	146,988	643
MINNESOTA				
1900	92,889	1,306	152,094	5,402
1890	51,701	457	130,607	3,261
1880	33,852	141	96,128	559
NEBRASKA				
1900	58,760	841	118,330	3,245
1890	34,596	175	129,106	3,186
1880	18,848	210	68,263	400
NORTH DAKOTA				
1900	23,774	419	43,699	1,312
1890	12,157	116	30,109	691
1880[2]	5,287	19	22,632	109
SOUTH DAKOTA				
1900	26,149	600	50,391	1,468
1890	12,256	117	53,409	1,277
1880[3]				

[1] See footnote 1, page 99.

[2] Includes returns from South Dakota.

[3] Included in returns for North Dakota.

AGRICULTURAL POPULATION OF NEW ENGLAND IN 1880, 1890, AND 1900. (CLASSIFICATION OF 1900).[1]

		In Agriculture	
	Total	*Male*	*Female*
NEW ENGLAND			
1900	287,829	277,956	9,873
1890	304,448	299,835	4,613
1880	304,679	303,679	1,000
CONNECTICUT			
1900	44,796	43,247	1,549
1890	45,596	44,830	766
1880	44,274	44,184	90
MASSACHUSETTS			
1900	66,551	64,669	1,882
1890	69,720	68,790	930
1880	65,215	64,988	227
MAINE			
1900	76,923	73,791	3,132
1890	81,284	79,821	1,463
1880	83,437	83,194	243
NEW HAMPSHIRE			
1900	38,782	37,224	1,558
1890	42,279	41,658	621
1880	45,122	44,931	191
RHODE ISLAND			
1900	10,957	10,673	284
1890	11,630	11,446	184
1880	10,986	10,951	35
VERMONT			
1900	49,820	48,352	1,468
1890	53,939	53,290	649
1880	55,645	55,431	214

[1] Data for 1890 and 1900 taken from Report of Twelfth Census, Population II, pp. cxxxv–cxxxix. As to data for 1880 see footnote 1, p. 93.

ACREAGE IN ALL FARM CROPS,[1] AS REPORTED IN 1880, 1890, AND 1900.[2]

	1900	*1890*	*1880*
UNITED STATES			
All Farm Crops	272,493,449	214,623,412	164,830,442
Cereals	184,983,220	140,378,857	118,805,952
Hay	61,691,069	52,948,797	30,631,054
Cotton	24,275,101	20,175,270	14,480,019
Cane	386,986	374,975	227,776
Tobacco	1,101,460	695,301	638,841
Hops	55,613	50,212	46,800
NORTH ATLANTIC DIVISION			
All Farm Crops	21,957,338	22,155,561	22,024,776
Cereals	8,957,452	8,869,351	9,913,840
Hay	12,919,041	13,205,321	12,026,364
Cotton			
Cane			
Tobacco	53,281	44,080	44,852
Hops	27,564	36,809	39,720
SOUTH ATLANTIC DIVISION			
All Farm Crops	26,481,330	23,730,022	22,135,566
Cereals	16,964,662	14,790,108	15,575,701
Hay	2,161,201	1,925,753	1,128,420
Cotton	6,842,489	6,746,292	5,165,175
Cane	47,223	32,888	24,778
Tobacco	465,754	234,981	241,480
Hops	1		12
NORTH CENTRAL DIVISION			
All Farm Crops	155,167,564	122,950,427	85,760,874
Cereals	119,324,898	90,584,015	70,154,743
Hay	35,676,042	32,220,468	15,490,866
Cotton	45,749	57,991	32,116
Cane			
Tobacco	120,516	86,789	78,038
Hops	359	1,164	5,111

[1] By "all farm crops" is meant the following crops: Barley, buckwheat, cane, corn, cotton, hay, hops, oats, rice, rye, tobacco, and wheat. These are all of the crops for which comparable data can be had and they constitute nearly the whole of the crop acreage. The only crops of any consequence, from the standpoint of acreage, and not included are: Broomcorn, flax, hemp, potatoes, vegetables, and orchard fruits.

[2] The data of hop acreage in 1879 and 1889 are taken from the Report of the Eleventh Census, Agriculture II, p. 91 *et seq.* All other data are taken from the Report of the Twelfth Census, Agriculture II, p. 63 *et seq.*

	1900	*1890*	*1880*
SOUTH CENTRAL DIVISION			
All Farm Crops	53,593,467	36,178,553	29,744,199
Cereals	31,521,429	20,222,568	19,350,718
Hay	3,883,662	1,913,532	633,433
Cotton	17,386,807	13,370,987	9,282,728
Cane	339,708	342,087	202,998
Tobacco	461,855	329,379	274,322
Hops	6		
WESTERN DIVISION			
All Farm Crops	15,293,750	9,608,849	5,165,027
Cereals	8,214,779	5,912,815	3,810,950
Hay	7,051,123	3,683,723	1,351,971
Cotton	56		
Cane	55		
Tobacco	54	72	149
Hops	27,683	12,239	1,957

INDEX

PAGE

Average size of farms, 1850–1900 47
acreage of improved land per farm 48
acreage in crops per farm 49
acreage in crops per worker 17
California, harvesting in 9
Cereal and hay acreage in 1899 52
Corn crop of 1869 15
Corn cultivators introduced . . . . . 4 and 8
Corn shelling 10
Cost of production 23
Cotton gin invented 6
Crop acreage in 1899 52
Crop products in 1839–1899 12
Displaced workmen, what becomes of 40
"Farm crops", includes what . . . . . 102, note
Farm life, improved condition of 69–75
Farm machinery, when introduced 1
Farm products, value per person 70
Farm work transferred to towns 43
Farming in Georgia in colonial times 3
Farms, influence of machinery on size of 47
Fluctuations in supply of farm products 27
Food supply per capita . . . . . 14, note
Labor, saving of 29
displacement of 30
absolute displacement of 31
relative displacement of 34
Laborers, dependent class, growth of 55–56
Longevity in different occupation classes 91
Mail, free delivery of 71
Machinery, includes what . . . . . 20, note
output of farm machinery 11
Census Office showing on effectiveness of 16
as a "product making" device 23
and quality of product 28
and labor 29
where most used 53
and general welfare 69
and illiteracy 83
influence of on population 76
and the length of the working day 84
Occupation classes, shifting in 37–38
growth of 42

Plow, in colonial times 4
Charles Newbold's cast iron plow 6
Daniel Webster's stump plow 5
Population and food-supply 13–14
Reaping machines, among the Gauls 1
in the United States 7, 9
Routine work 78
Threshing, in colonial times 2
in the United States about 1870 8
"Unskilled workmen" . . . . . 62 and note
Wages, daily 60
monthly 65
Wage rates, sympathetic variations in 68
Webster and his plow 5
Women's work on the farm 74
Working-day, length of 84

HB
1
A5
ser.3
v.5

American Economic Association
Publications

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY